11 Climate

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11.1 Introduction

No revisions were necessary to this EIAR chapter in responding to Dun Laoghaire - Rathdown County Council (DLR CC) decision to request Further Information dated 25th March 2026 in respect of LRD26A/0051/WEB.

This chapter of the EIAR identifies, describes, and presents an assessment of the eventual significant direct and indirect effects of the Proposed Development at Temple Road, Blackrock, Co. Dublin on climate (for example greenhouse gas (GHG) emissions) and its vulnerability to climate change.

It should be read in conjunction with Ch. 10 Air Quality, Ch. 14 Material Assets Traffic and Transport and the Traffic and Transport Assessment, as well as the Energy Analysis Report, Building Life Cycle Assessment Report and Site-Specific Flood Risk Assessment, Climate Change Impact Assessment submitted with the planning application.

A full description of the Proposed Development can be found in Chapter 2 of this EIAR.

Climate change is recognised as one of the most serious global environmental problems and arguably the greatest challenge facing humanity today. While natural variations in climate over time are normal, anthropogenic activities have interfered greatly with the global atmospheric system by emitting substantial amounts of greenhouse gases (GHGs). This has caused a discernible effect on our global climate system, with continued change expected due to current and predicted trends of GHG emissions. In Ireland this is demonstrated by rising sea levels, changes in the ecosystem, extreme weather events and biodiversity loss.

The GHG assessment evaluates the project's climate impact across different life stages, considering a 50-year building life expectancy. It categorises greenhouse gas emissions into four main stages based on BS EN 15978: Production (embodied carbon from raw material extraction to product manufacturing), Pre-construction/Construction (impacts from product delivery and assembly), Operational (emissions from building operations, maintenance, and replacement), and End of Life (deconstruction and disposal activities). The assessment includes the first three stages, while the End-of-Life stage is excluded due to uncertainties in deconstruction methods.

Attention will be focused on Ireland's obligations under the Paris Agreement (Climate Action Plan & Corresponding carbon budgets) in the context of the overall climatic impact of the presence and absence of the Proposed Development.

11.1.1 Quality Assurance and Competency of Experts

This Chapter was prepared by Leah Moloney, Environmental Consultant, DNV. Leah has a BA of Science (Hons) degree. Leah has worked as an Environmental Consultant with DNV since 2024 and has built up experience preparing Climate Change Impact Assessments, Environmental Impact Assessment (EIA) Screening Reports, Air Quality and Climate, Noise and Vibration, and Material Assets (Waste and Utilities) assessments and chapters for EIARs.

11.2 Greenhouse Gas Emissions in Ireland

Ireland's latest GHG emissions 1990-2024 are based on the Sustainable Energy Authority Ireland's (SEAI's) provisional energy balance released in June 2025 (EPA, 2025). Total national greenhouse gas emissions in 2024 (excluding LULUCF) are estimated to be 53.75 million tonnes carbon dioxide equivalent (Mt CO_2eq) which is 2.0% lower (or 1.09 Mt CO_2eq) than emissions in 2023 (54.85 Mt CO_2eq) and follows a 6.8% decrease in emissions reported for 2023. Emissions in 2024 are 3.6% lower than the historical 1990 baseline. National total emissions including Land Use Land Use Change and Forestry (LULUCF) decreased by 1.9% to 57.65 Mt CO_2eq. ETS4 and ESR emissions decreased by 7.4% and 0.5% respectively (EPA, 2025).

Arresting growth in emissions is a challenge in the context of a growing economy but one which must continue to be addressed by households, business, farmers and communities if Ireland is to reap the benefits of a low-carbon economy.

The GHG emission inventory for 2024 is the fourth of ten years over which compliance with targets set in the European Union's Effort Sharing Regulation (EU 2018/842) will be assessed. This Regulation sets 2030 targets for emission reductions outside of the Emissions Trading Scheme (known as ESR emissions) and annual binding national limits for the period 2021-2030. Ireland's target is to reduce ESR emissions by 42% by 2030 compared with 2005 levels, with a number of flexibilities available to assist in achieving this. The ESR includes the sectors outside the scope of the EU Emissions Trading System (ETS) (such as Agriculture, Transport, Residential, Public Services and Commercial Services and Waste).

Ireland's ESR emissions annual limit for 2024 is 38.68 Mt CO2eq. Ireland's provisional 2024 GHG ESR emissions are 42.42 Mt CO2eq; this is 3.74 Mt CO2eq more than the annual limit for 2024. This value is the national total emissions less emissions generated by stationary combustion, i.e., power plants, cement plant, and domestic aviation operations that are within the EU's emissions trading scheme. Cumulatively from 2021-2024 and after using the ETS flexibility, Ireland is not in compliance with the ESR by a net distance to target of -1.30 Mt CO2eq. In 2024, there is an exceedance of 1.83 Mt CO2eq above its Annual Emissions Allocation with the ETS flexibility. Agriculture and Transport accounted for 75.4% of total ESR emissions in 2024. The revised LULUCF Regulation (2023)10 incorporates new rules around LULUCF flexibilities for the period 2021-2025 and 2026-2030. There is a high degree of uncertainty relating to the availability of the LULUCF flexibility and, if available, the quantity of flexibility in each budgetary period (EPA, 2025).

The latest projections (May 2025) indicate that currently implemented measures (With Existing Measures) will achieve a reduction of 10% on 2005 levels by 2030, significantly short of the 42% reduction target. If measures in the higher ambition (With Additional Measures) scenario are implemented, EPA projections show that Ireland can achieve a reduction of 22% by 2030, still short of the 42% reduction target.

In terms of the 2030 targets, the ESR provides two flexibilities (use of ETS allowances and credit from action undertaken in the land use, land use change and forestry (LULUCF) sector) to allow for a fair and cost-efficient achievement of the targets. New Regulations in 2023 mean there are new rules around LULUCF flexibility that incorporates split budgets 2021-2025 to 2026-2030[1]. Additional analyses are needed to estimate the impact of the new rules on flexibilities. In the interim, based on latest LULUCF inventory and projections data, the maximum amount of LULUCF flexibility now projected to be available is 13.4 Mt CO_2eq in the first 5-year period (or 2.68 Mt CO_2eq per annum), with no flexibility available in the second 5-year period.

Ireland's GHG (GHG) emissions increased in the period from 1990 to 2001 where it peaked at 70.85 Mt CO_2 equivalent, before displaying a downward trend to 2014. Emissions increased by 4.0% and 3.8%, respectively in the years, 2015 and 2016 and remained relatively stable in 2017 and 2018, followed by a 3.0% decrease in 2019. In 2020 total national GHG emissions were 3.6% lower than 2019 emissions largely driven by the covid restrictions. The gradual lifting of covid restrictions in 2021 along with an increase in the use of coal and less renewables within electricity generation resulted in a 4.5% increase in emissions in 2021 compared to 2020. A 2.1% decrease in emissions was seen in 2022 compared to 2021, mainly due to a substantial decrease in residential sector emissions combined with decreases from industry, agriculture and electricity generation. This was followed by a 6.8% reduction in emissions in 2023 and 2% in 2024 on 2023 levels. Ireland's GHG emissions have decreased by 3.6% from 1990-2024.

In relation to the GHGs; carbon dioxide (CO_2) accounted for 61.1% of the total, with methane (CH_4) and nitrous oxide (N_2O) contributing 28.9% and 8.8% as CO_2 equivalent, respectively and F-gases contributing 1.2% of the total as CO_2 equivalent.

Agriculture is the largest contributor to the overall emissions at 38.0% of the total (excluding LULUCF). Transport and Energy Industries are the second and third largest contributors at 21.7% and 13.3%, respectively. Residential and Manufacturing Combustion emissions account for 10.4% and 7.7%, respectively. These five sectors accounted for 91.1% of national total emissions in 2024. The remainder is made up by the Industrial Processes sector at 3.5%, F-Gases at 1.1%, Commercial Services at 1.4%, Public Services at 1.3% and Waste at 1.6%.

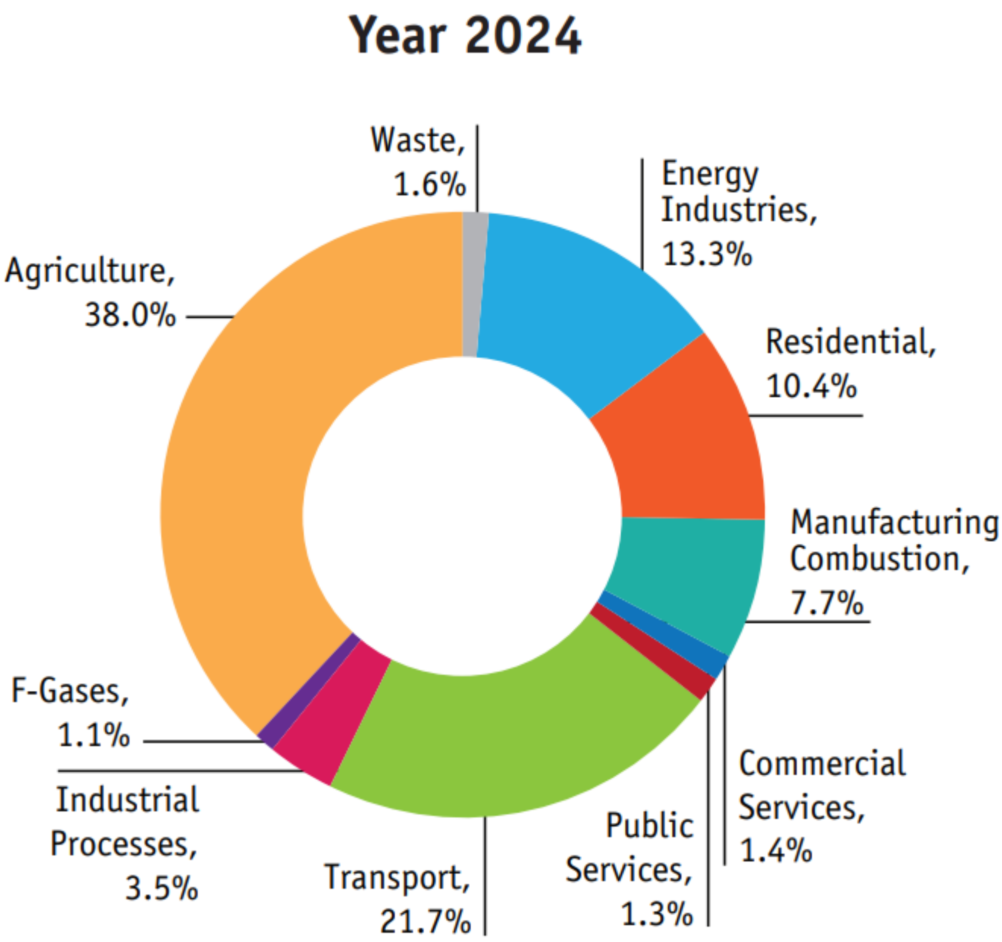

Figure 11.1- Ireland's Greenhouse Gas Emissions Share by Sector 2024 (Source: EPA, 2025)

The Climate Change Advisory Council submitted its latest Annual Review 2025 in a series of sectoral reports between March and July 2025, with the final update published on August 8, 2025. Detailed key messages, including observations and recommendations for each sector (electricity; transport; built environment; enterprise and waste; agriculture, forestry, and other land use; and biodiversity), can be found at the beginning of each chapter in the annual review (CCAC, 2025).

The overall recommendations are as follows:

- Extreme Weather Preparedness: The Council urges the Government to establish a National Climate Damage Register to monitor and record the economic, social, and environmental impacts of extreme weather events. This is essential to improve Ireland's readiness for future climate shocks.
- Electricity Infrastructure Resilience: Following severe disruptions from Storms Darragh and Éowyn, the Council recommends urgent investment in grid modernization and resilience planning for critical services such as water, telecoms, and transport.
- Transport Sector Reform:

  - A full review of transport taxation (including vehicle registration tax, motor tax, excise duty, carbon tax, fuel pricing, and distance-based charges) is needed to align fiscal policy with climate goals.
  - Road space should be reallocated to support walking, cycling, and public transport.
  - Planning reform must ensure new developments reduce transport demand and accelerate delivery of sustainable infrastructure.
  - Local authorities need support to implement low-emission zones, shuttle services, and carpooling incentives.
  - School transport must be expanded to reduce car journeys, with continued investment in walking and cycling initiatives.
- Agriculture and Land Use: The Council supports scaling up agri-environmental schemes like ACRES and implementing the National Biomethane Strategy to produce 1 TWh of renewable gas by 2025. Continued reductions in fertiliser use and methane emissions are essential.
- Energy Security and Fossil Fuel Phase-Out: The Council expresses serious concerns about fossil-powered data centres and LNG terminals. It recommends:
  - Halting new fossil fuel infrastructure approvals
  - Ensuring new data centre demand is met entirely by renewables
  - Full depreciation of fossil fuel assets by 2050, especially in the gas network

11.3 Legislation, Policy and Guidance

The key legislation and guidance referenced in the preparation of the EIAR is outlined in Chapter 1: Introduction (Sections 1.5, 1.6 and 1.7). Specific to Climate, the following legislation, guidance, and planning framework relevant to the consideration of this factor has informed the assessment as outlined below.

11.3.1 International Legislation/Commitments/Agreements

In March 1994, the United Nations Framework Convention on Climate Change (UNFCCC) was established as an intergovernmental effort to tackle the challenges posed by climate change. The Convention membership is almost universal, with 197 countries having ratified. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices. This information is then utilised to launch national strategies and international agreements to address GHG emissions. Following the formation of the UNFCCC, two major international climate change agreements were adopted: The Kyoto Protocol, and the Paris Agreement.

In April 1994, Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) and subsequently signed the Kyoto Protocol in 1997. The Kyoto Protocol is an international agreement linked to the UNFCCC which commits its parties to legally binding emission reduction targets. In order to ensure compliance with the protocol, the Intergovernmental Panel on Climate Change (IPCC) has outlined detailed guidelines on compiling National GHG Inventories. These are designed to estimate and report on national inventories of anthropogenic GHG emissions and removals. Under Article 4 of the Kyoto Protocol, Ireland agreed to limit the net anthropogenic growth of the six named GHGs to 13% above the 1990 level, spanning the period 2008 to 2012 (IPPC, 2006).

The second commitment period of the Kyoto Protocol was established by the Doha amendment which was adopted in extremis on the 8th of December 2012, to impose quantified emission limitation and reduction commitments (QELRCs) to Annex I (developed country) Parties during a commitment period from 2013 to 2020. 38 developed countries, inclusive of the EU and its 28 member states, are participating. Under the Doha amendment, participating countries have committed to an 18% reduction in emissions from 1990 levels. The EU has committed to reducing emissions in this period to 20% below 1990 levels. Ireland's QELRCs for the period 2013 to 2020 is 80% of its base year emissions. Ireland's compliance with the Doha amendment was assessed based on the GHG inventory submission in 2022 for 1990-2020 data. Ireland complied procedurally with its submission obligations under the Doha Amendment, by delivering a complete 1990–2020 inventory in 2022 and its submission has been considered acceptable. As of October 2020, the Doha Amendment has received the required number of ratifications to enter into force. Once in force, the emission reduction commitments of participating developed countries and economies in transition (EITs) become legally binding.

The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by all United Nations Member States in 2015 as a universal call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity by 2030. The 17 SDGs are integrated—that is, they recognise that action in one area will affect outcomes in others, and that development must balance social, economic, and environmental sustainability. The creativity, knowhow, technology and financial resources from all of society is necessary to achieve the SDGs in every context. At its heart, the SDGs are about global partnership for this call to action. No matter how large or small, and regardless of their industry, all companies can contribute to the SDGs through their sustainability and corporate social responsibility strategies, policies, and processes.

Figure 11.2- UN Sustainable Development Goals (Source: THE 17 GOALS | Sustainable Development)

Ireland has published a Sustainable Development Goals National Implementation Plan 2022-2024 to provide a whole-of-government approach to implementing these goals. Sustainable development, climate change and equity are intrinsically intertwined. Climate change impacts can be linked in one way or another to all 17 of the UN Sustainable Development Goals (SDGs). Climate action that considers co-impacts across other SDGs can increase efficiency, reduce costs and support early and ambitious climate action (DECC, 2022). A new plan is in the initial stages of development and is expected to be published in the first half of 2026.

11.3.2 European Legislation

GHG Legislation

In December 2015, the Paris Climate Change Conference (COP21) took place and was an important milestone in terms of international climate change agreements. The Paris Agreement sets out a global action plan to put the world on track to mitigate dangerous climate change by setting a global warming limit not to exceed 2°C above pre-industrial levels, with efforts to limit this to 1.5°C.

As a contribution to the objectives of the agreement, countries have submitted national climate action plans (nationally determined contributions, (NDCs)). Under this agreement, governments agreed to come together every 5 years to assess the collective progress towards the long-term goals and inform Parties in updating and enhancing their nationally determined contributions. Ireland will contribute to the Paris Agreement through the NDC tabled by the EU on behalf of Member States in 2020, which commits to a 55% reduction in EU-wide emissions by 2030 compared to 1990. This is considered to be the current NDC maintained by the EU and its Member States under Article 4 of the Paris Agreement.

The EU has set itself targets for reducing its GHG emissions progressively up to 2050, these are outlined in the 2020 climate and energy package and the 2030 climate and energy policy framework. These targets are defined to assist the EU in transitioning to a low-carbon economy, as detailed in the 2050 low carbon roadmap. The 2020 package is a set of binding legislation to ensure that the EU meets its climate and energy targets for the year 2020 (EEA; 2020). There are three key targets outlined in the package which were set by the EU in 2007 and enacted in legislation in 2009:

- 20% reduction in GHG emissions from 1990 levels;
- 20% of EU energy to be from renewable sources; and
- 20% improvement in energy efficiency.

The 2030 climate and energy framework builds on the 2020 climate energy package and was adopted by EU leaders in October 2014. The framework sets three key targets for the year 2030:

- At least 40% cuts in GHG emissions from 1990 levels;
- At least 32% share for renewable energy; and
- At least 32.5% improvement in energy efficiency.

The EU has acted in several areas in order to meet these targets, including the introduction of the Emissions Trading System (ETS). The ETS is the key tool used by the EU in cutting GHG emissions from large-scale facilities in the power, industrial, and aviation sectors. Around 45% of the EU's GHG emissions are covered by the ETS.

As part of the European Green Deal, the EU Commission proposed in September 2020 to raise the 2030 GHG emission reduction target, including emissions and removals, to at least 55% compared to 1990. The European Climate Law came into force in July 2021 and writes into law the goal set out in the European Green Deal for Europe's economy and society to become climate-neutral by 2050. The law also sets the intermediate target of reducing net GHG emissions by at least 55% by 2030, compared to 1990 levels.

Corporate Sustainability Reporting Directive (CSRD)

On 5 January 2023, the Corporate Sustainability Reporting Directive (CSRD) entered into force. It modernises and strengthens the rules concerning the social and environmental information that companies must report. The CSRD is effective from 01 January 2024 for those entities already subject to the NFRD (reporting in 2025) and from 01 January 2025 for all other large companies (reporting in 2026).

Companies subject to the CSRD will have to report according to European Sustainability Reporting Standards (ESRS). The standards are developed in a draft form by the EFRAG, previously known as the European Financial Reporting Advisory Group (EFRAG, 2024). Specifically, the findings may serve as an evidence base for EFRAG Standard ESRS E1 CLIMATE CHANGE.

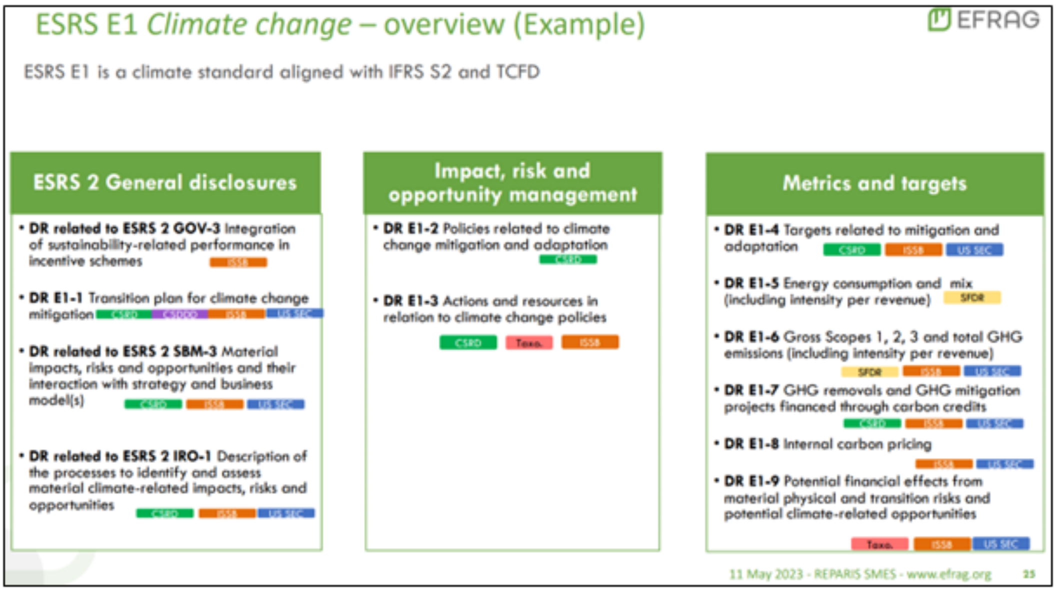

Figure 11.3- ESRS E1 Climate Change: presented by Eric Duvaud, EFRAG SR TEG member (Source: [The first set of ESRS – the journey from PTF to delegated act (adopted on 31 July 2023) – EFRAG)]

The data/information from this Climate Chapter should be considered for Impact, Risk and Opportunity Management Disclosure Requirements 20 and 21 below within ESRS E1 CLIMATE CHANGE (EFRAG; 2023):

20. The undertaking shall describe the process to identify and assess climate-related impacts, risks and opportunities. This description shall include its process in relation to:

(a) impacts on climate change, in particular, the undertaking's GHG emissions (as required by Disclosure Requirement ESRS E1-6);

(b) climate-related physical risks in own operations and along the upstream and downstream value chain, in particular:

i. the identification of climate-related hazards, considering at least high emission climate scenarios; and
ii. the assessment of how its assets and business activities may be exposed and are sensitive to these climate-related hazards, creating gross physical risks for the undertaking.

(c) climate-related transition risks and opportunities in own operations and along the upstream and downstream value chain, in particular:

i. the identification of climate-related transition events, considering at least a climate scenario in line with limiting global warming to 1.5°C with no or limited overshoot; and
ii. the assessment of how its assets and business activities may be exposed to these climate-related transition events, creating gross transition risks or opportunities for the undertaking.

21. When disclosing the information required under paragraphs 20 (b) and 20 (c) the undertaking shall explain how it has used climate-related scenario analysis, including a range of climate scenarios, to inform the identification and assessment of physical risks and transition risks and opportunities over the short-, medium- and long-term.

Corporate Sustainability Due Diligence Directive (CSDDD)
This proposed Directive establishes a corporate due diligence duty. The core elements of this duty are identifying, bringing to an end, preventing, mitigating and accounting for negative human rights and environmental impacts in the company's own operations, their subsidiaries and their value chains. In addition, certain large companies must have a plan to ensure that their business strategy is compatible with limiting global warming to 1.5 °C in line with the Paris Agreement.

The CSDDD is expected to complement the CSRD as it will require companies to implement comprehensive identification, prevention and mitigation processes to eliminate adverse human rights and environmental impacts in the company's own operations, its subsidiaries and value chains. It will also complement the Taxonomy Regulation that requires specific details of what constitute "environmentally sustainable" investments.

It is expected that the CSDDD will require companies in scope to ensure the identification, prevention, mitigation and ability to account for any adverse environmental impacts, with adequate governance, management systems and measures in place to this end.

For instance, regarding adverse climate change impacts, a company would have to obtain quantitative and qualitative information about baseline conditions at higher risk sites or facilities. Identification of adverse impacts would include assessing the environmental context in a dynamic way and at regular intervals, prior to a new activity or relationship; prior to major decisions or changes in the operation; in response to or anticipation of changes in the operating environment; and periodically (at least every 12 months) throughout the life of an activity or relationship. The following Climate Change Impact Assessment can serve as due diligence demonstrating partial compliance with the CSDDD.

11.3.3 National Legislation

Climate Action and Low Carbon Development Act

The Climate Action and Low Carbon Development Act 2015 (the principal act) set national climate policy on a statutory footing for the first time in Ireland, with the target of pursuing the transition to a low-carbon, climate-resilient, and environmentally sustainable economy by 2050. The principal act was subsequently amended by the Climate Action and Low Carbon Development (Amendment) Act 2021 (the '2021 Act') which sets Ireland on a legally binding path to net-Zero emissions no later than 2050, and to a 51% reduction in emissions by the end of this decade (Government of Ireland; 2015).

The 2021 Act provides a legally binding framework with clear targets and commitments set in law, and ensures the necessary structures and processes are embedded on a statutory basis to ensure Ireland achieves its national, EU and international climate goals and obligations in the near and long term. Policy amendments will involve the rapid electrification of transport system: electric bikes, electric vehicles, and electric public transport. This will be enacted in tandem with a ban on new registrations of petrol and diesel cars from 2030. Furthermore, there will be a policy to incentivise behavioural changes by increased effective modal shift to walking, cycling and public transport infrastructure.

The 2021 Climate Act incorporates carbon budgets and sectoral emissions limits, defining the carbon budget as the total allowable GHG emissions during the budget period. Consequently, the Act has removed any mention of a national mitigation plan, replacing it with references to both former and latest versions of the Climate Action Plan, as well as a series of National Long Term Climate Action Strategies. Additionally, it has updated the national transition objective to a national climate objective, committing "to pursue and achieve, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy" (Government of Ireland; 2022).

Section 6B(12) of the 2021 Climate Act requires the Minister for the Climate, Energy and the Environment to publish the approved carbon budget programme. In May 2022 the budgets were published and the total emissions allowed under each budget is set out below, as well as the average annual reduction for each 5-year period (DECC, 2022):

- 2021-2025: 295 Mt CO2eq - this represents an average reduction in emissions of 4.8% per annum for the first budget period.

- 2026-2030: 200 Mt CO2eq - this represents an average reduction in emissions of 8.3% per annum for the second budget period.
- 2031-2035: 151 Mt CO2eq - this represents an average reduction in emissions of 3.5% per annum for the third provisional budget.

To meet these targets, the government published a set of Sectoral Emissions Ceilings in July 2022 and each sector has been assigned a % reduction target on the 2018 baseline to achieve a ceiling of 295 Mt CO2eq by 2025 and 200 Mt CO2eq by 2030 (DECC, 2022).

The assessment in this chapter has been prepared in accordance with, among other things, the 2021 Act and the EIA Directive.

The 2021 Act also introduces a requirement for each local authority to prepare a Climate Action Plan, which will include both mitigation and adaptation measures and be updated every five years. Local authority Development Plans will also align with their Climate Action Plan (DECC, 2021).

The proposed project is consistent with the following plans, strategies and objectives specified in section 15 of the Climate Action and Low Carbon Development Act 2015, as amended:

- The National Climate Objective;
- The most recent Climate Action Plan;
- The most recent National Long-Term Climate Action Strategy;
- The most recent National Adaptation Framework; and
- The objective of mitigating GHG emissions and adapting to the effects of climate change in the State.

The Act mandates the relevant Minister to develop the Climate Action Plan, the National Long-Term Climate Action Strategy, and the National Adaptation Framework to achieve the National Climate Objective (DECC, 2021). This objective of becoming 'climate neutral' by 2050 aligns with the EU's climate goal as established in Regulation (EU) No 2021/1119 (the 'European Climate Law'). The European Climate Law enshrines into EU legislation the target set by the European Green Deal for the EU to attain climate neutrality, or 'net zero' GHG emissions, by 2050.

The Climate Action Plan 2025 (CAP25) is the fourth annual update to Ireland's Climate Action 2019 (the plans are to be updated annually to ensure alignment with Ireland's legally binding economy-wide carbon budgets and sectoral ceilings) (DECC; 2023). This plan is the third to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021, and following the introduction, in 2022, of economy-wide carbon budgets and sectoral emissions ceilings. The plan had a delayed launch on April 15th, 2025.

The plan implements the carbon budgets and sectoral emissions ceilings and sets out a roadmap for taking decisive action to halve our emissions by 2030 and reach net zero no later than 2050, as committed to in the Programme for Government. Climate Action Plan 2025 builds on Climate Action Plan 2024, outlining how Ireland will accelerate the actions required to respond to the climate crisis, putting climate solutions at the centre of Ireland's social and economic development (DECC; 2025). Climate Action Plan 2025 is a streamlined Climate Action Plan, to be read in conjunction with Climate Action Plan 2024. It is also the final Climate Action Plan of the first 5-year Carbon Budget – marking an important midpoint in what has been called the decade of climate action.

The supplementary Annex of Actions, approved by the Irish Government, provides the specific actions required to implement the targets set out in the Plan, and includes information regarding outputs, lead departments, timelines and stakeholders. For 2025 a a similar approach to the 2024 Annex has been implemented that will see only new, high-impact actions included in the Annex, while the full roadmap of actions to support the delivery of our climate targets remains within the Climate Action Plan itself (DECC; 2025).

11.3.4 National Policy

National Adaptation Framework (NAF)

Ireland's second statutory National Adaptation Framework (NAF) was published on 5 June 2024 by Minister Eamon Ryan TD, replacing the original 2018 framework following its mandated five-year review under the Climate Action and Low Carbon Development Act 2015 1 2 3. The updated NAF continues to set out the national strategy to reduce the country's vulnerability to climate change impacts and to avail of potential benefits, while integrating lessons learned from recent extreme weather events and evolving climate science.

The 2025 NAF builds on the foundational work of the National Climate Change Adaptation Framework (NCCAF, 2012) and the first NAF (2018), but introduces several new principles and priorities:

- Avoiding maladaptation
- Nature-based Solutions
- Just Resilience (an evolution of the "just transition" concept)
- Greater consideration of socio-economic vulnerability
- Improved cross-sectoral cooperation

The framework maintains its whole-of-government and society approach, emphasizing collaboration with civil society, the private sector, and the research community. It also strengthens the enabling environment for adaptation through updated sectoral planning guidelines and local authority strategies.

Under the 2025 NAF all government departments must prepare or update Sectoral Adaptation Plans for priority areas, including two newly added sectors: Tourism and Built Environment/Planning. Local authorities continue to develop Local Adaptation Strategies, supported by new guidance documents such as the Heritage and Climate Adaptation Guidance for Local Authorities.
In terms of integration with broader climate policy the NAF is closely aligned with CAP25, approved in April 2025, which refines Ireland's roadmap to halve emissions by 2030 and reach net zero by 2050. CAP25 includes a focused Annex of Actions for 2025 and cross-cutting measures in energy, buildings, transport, enterprise, land use, and adaptation.

The National Climate Change Risk Assessment (NCCRA)
The National Climate Change Risk Assessment (NCCRA) was published in May 2024 (EPA, 2024). The NCCRA was required to be developed under Action 457 from the 2021 CAP (Government of Ireland 2021). Action 457 seeks to
"Further develop Ireland's national climate change risk assessment capacity to identify the priority physical risks of climate change to Ireland".

The NCCRA uses definitions of the risk determinants from the Intergovernmental Panel on Climate Change (IPCC) Risk Framework (IPCC 2023):

- Hazard – the potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources.
- Exposure – the presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected.
- Vulnerability – the propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts including sensitivity.
- Risk – the potential for adverse consequences for human or ecological systems.

When considering risk, the NCCRA assesses exposure and vulnerability for two future climate change scenarios or Representative Concentration Pathways (RCPs):

- RCP4.5 was selected as it represents a scenario aligned with the global temperature trajectory.
- RCP8.5 was selected as it represents a high-emissions scenario and achieves the highest level of modelled temperature increases by the end of the century. Consequently, this scenario will result in the highest level of physical risk for Ireland, and therefore the greatest requirement for adaptation.

These scenarios align with a conservative approach to the assessment of risks to Ireland and assume that global emission reduction targets are not met. This aligns with the principle of precaution as stated in the NAF (DECC 2024). In addition to the future climate scenarios, the NCCRA assesses the risk from the future climate during the following timeframes:

- Present (~2030);
- Medium term (~2050); and
- Long term (~2100).

Just Transition

The 2021 Climate Action Plan sets out a just transition framework consisting of four principles to underpin both processes and implementation of all climate action policies and measures. Provisions under the 2021 CAP have been carried over to CAP25 without substantive changes. The present report primarily examines the impact of climate change (Government; 2021). However, we recommend that due consideration be given to the concept of a "just transition," aligning with the Irish Government's framework, to ensure a comprehensive approach to addressing the climate crisis that extends beyond mere climate action.

The just transition framework is made up of four principles (DECC; 2021):

- An integrated, structured, and evidence-based approach to identify and plan our response to just transition requirements.
- People are equipped with the right skills to be able to participate in and benefit from the future net zero economy.
- The costs are shared so that the impact is equitable and existing inequalities are not exacerbated.
- Social dialogue to ensure impacted citizens and communities are empowered and are core to the transition process.

Regional Policy

Action 8 of Ireland's second statutory National Adaptation Framework (NAF), published on 5 June 2024, reaffirms the establishment of four Climate Action Regional Offices (CAROs) to support climate adaptation at the local level 1 2. The Eastern & Midlands CARO remains one of these offices, with a continued mandate to assist local authorities in its region in preparing and implementing Local Authority Climate Action Plans (LACAPs).

Under the updated NAF and the Climate Action Plan 2025 (CAP25), CAROs play a critical role in:

- Capacity building within local government
- Mainstreaming adaptation into planning and development
- Facilitating cross-sectoral collaboration
- Supporting alignment with national climate objectives and sectoral adaptation plans

The Eastern & Midlands CARO specifically supports councils such as Meath, Louth, Dublin City, Fingal, South Dublin, and Dún Laoghaire-Rathdown, ensuring that their climate action plans reflect the latest national strategies and regional vulnerabilities.

This updated framework emphasises Just Resilience, nature-based solutions, and community empowerment, aligning with the broader just transition principles carried forward from CAP21 into CAP25.

11.3.5 Dún Laoghaire-Rathdown Council Climate Action Plan 2024-2029

In February 2024, Dún Laoghaire-Rathdown County Council (DLRCC) adopted the Dún Laoghaire-Rathdown County Council Climate Action Plan 2024-2029 (DLRCC CCAP). The Action Plan is the climate adaptation and mitigation strategy for the County, and sets out to achieve, by no later than the end of 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral County. Aligned to the Government's National Climate Objective (as set out in the national Climate Action Plan 2024), the new Plan outlines mitigation and adaptation climate action measures across the following six thematic areas:

- Energy & Buildings,
- Transport,
- Flood Resilience,
- Nature Based Solutions,
- Circular Economy & Resource Management and
- Citizen Engagement.

The actions in these themes collectively address the main goals and targets of this plan:

1. 50% improvement in DLRCC's energy efficiency by 2030
2. 51% reduction in DLRCC's greenhouse gas emissions by 2030
3. To make Dublin a climate resilient region for all, by reducing the impacts of future climate change-related events;
4. To actively engage and inform our communities on climate action.

The Plan sets out how DLRCC will be responsible for enhancing climate resilience, increasing energy efficiency and reducing greenhouse gas emissions across its own assets, services and infrastructure to which it is fully accountable for.

In the development of the CAP, DLRCC has reviewed the risks posed by climate change for the County and the implications of these risks for the delivery of services by DLRCC. This has been achieved through a Climate Change Risk Assessment (CCRA) which identifies the likelihood of future climate hazards and their potential impacts. The CCRA has been undertaken, in accordance with 'Technical Annex B: Climate Change Risk Assessment' of the 'Local Authorities Climate Action Planning Guidelines'.

A qualitative CCRA supports the identification and prioritisation of potential future climate risks for more detailed analysis and provides a broad understanding of where adaptation actions could be required. The approach comprises of two phases, where both current and future risks and impacts are assessed.

11.3.6 DLRCC County Development Plan (CDP) 2022-2028

The new DLRCC CDP sets out the policy objectives and the overall strategy for the proper planning and sustainable development of the County over the plan period from 2022 to 2028.

The Climate Action (Chapter 3) sets out detailed policy objectives in relation to climate action and the role of planning in climate change mitigation, climate change adaptation, and the transition towards a more climate resilient County. The Chapter addresses four key issues, namely:

- Energy Efficiency in Buildings;
- Renewable Energy;
- Decarbonising Motorised Transport;
- Urban Greening.

These issues have been identified as being of particular significance in helping to achieve sustainable planning outcomes which will ultimately help to deliver a low carbon and a climate resilient County. Planning already plays a role in each of the key areas identified in the DLRCC CAP. Having regard to the headings set out in the DLRCC CAP, the Development Plan contains a range of policy objectives which aim to mitigate and adapt to climate change.

The creation of a climate resilient County is an overarching strategic outcome of the DLRCC CDP, and as such, the theme permeates the entire plan with a selection of policy objectives in multiple Chapters all contributing to aid in the transition of the County to a climate resilient low carbon society. Relevant policy objectives and their incorporation into the Proposed Development design have been considered in this report.

The DLRCC 'Climate Change Action Plan' (2024-2029) outlines a number of goals and plans to prepare for and adapt to climate change. There are five key action areas within the plan:

- Energy and buildings,
- Transport,
- Flood resilience,
- Nature-based solutions and
- Resource management.

The St. Teresa's residential development will incorporate the following measures:

- Reducing emissions in operations and ensuring they are environmentally considerate.
- Building sustainable and energy efficient homes, achieving a minimum A3 BER for new buildings.
- Sustainability in adaptable design
- Sustainable and responsible sourcing of materials
- Generate and use renewable energy through heat pumps, CHP units and solar PV arrays.

St. Teresa's sustainability measures align well with the DLRCC 'Climate Change Action Plan' (2024-2029). Both incorporate important measures for addressing climate change and enhancing resilience to its impacts.

DLRCC Climate Change Action Plan (2024-2029) focus on increasing the city's resilience to climate change by identifying key risks and vulnerabilities, implementing climate-resilient actions, and mainstreaming climate adaptation considerations into all operations and functions. DLRCC Development Plan aims to promote inclusive growth, enhance quality of life, and support healthy placemaking throughout the county. This aligns with St. Teresa's residential development measures to integrate sustainable practices into all aspects of their operations and make a significant impact on emissions by utilising heat pumps, CHP units and solar PV arrays.

Key areas of alignment include:

- Climate Resilience: DLRCC strategies prioritise enhancing resilience to climate change. St. Teresa's residential development's focus on sustainable homebuilding and reducing environmental impact compliments DLRCC's climate goals.
- Sustainable Development: St. Teresa's residential development's commitments to providing high-quality, affordable housing and integrating sustainable practices aligns with DLRCC's focus on integrating climate considerations into the design, planning, and construction of infrastructure.
- Sustainable Procurement: Where possible, St. Teresa's residential development will specify the use of local materials containing recycled content and will reintegrate materials arising from demolition works as long as is technically viable. This aligns with DLRCC's policy objective to support the use of structural materials in the construction industry to have low embodied energy and CO_2 emissions.

11.3.7 Guidance

The assessment has referred to national guidelines, where available, in addition to international standards and guidelines relating to the assessment of GHG emissions and associated climatic impact. These are summarised below:

- 2030 Climate and Energy Policy Framework (European Commission, 2014)
- 2030 EU Climate Target Plan (European Commission, 2021b)
- Assessing GHG Emissions and Evaluating their Significance the Institute of Sustainability & Environmental Professionals (ISEP formerly known as IEMA), 2022)
- Carbon Management in Infrastructure (European Commission, 2013)
- Climate Action and Low Carbon Development Act 2015 (as amended).
- Climate Action Plan 2025 (Government of Ireland, 2025)
- Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate (UK Highways Agency, 2019)
- Department of Housing, Planning, and Local Government. Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018)
- European Commission. Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (2013)
- European Commission. Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (2021a)
- IEMA. EIA Guide to: Climate Change Resilience and Adaptation (2020a)
- IEMA. GHG Management Hierarchy (2020b)

- IEMA. Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance (2022)
- Irish Green Building Council, Land Development Agency (LDA), and Environmental Protection Agency (EPA). The Carbon Designer for Ireland Tool
- Publicly Available Specification (PAS) 2080: 2016
- Transport Infrastructure Ireland (TII). GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document (2022c)
- Transport Infrastructure Ireland (TII). GE-GEN-01101: Guide to the Implementation of Sustainability for TII Projects (2023)
- Transport Infrastructure Ireland (TII). PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (2022a)
- Transport Infrastructure Ireland (TII). PE-ENV-01105: Climate Assessment Standard for Proposed National Roads (2022b)
- Integrating Climate Change into Strategic Environmental Assessment in Ireland – A Guidance Note (EPA, 2015)

11.4 Study Methodology

Carbon dioxide (CO2) emissions have a global climate warming effect. This is regardless of rate of release, location or the weather when released into the atmosphere. This is unlike pollutants that affect local air quality where the rate of release, location and prevailing weather, as well as the amount of pollutant, determines the local concentrations and the impact.

Local ambient concentrations of CO2 are not relevant for climate change and there are no limits or thresholds that can be applied to particular sources of carbon emissions. Any amount of CO2 released into the atmosphere will contribute to climate warming, the extent of which is determined by the magnitude of the release. Although CO2 emissions are typically expressed as kilogrammes or tonnes per year, there is a cumulative effect of these emissions because CO2 emissions have a warming effect which lasts for 100 years or more.

In this regard, the methodology adopted in this chapter covers two separate assessments – a GHG assessment (GHGA) and a climate change risk assessment (CCRA).

- GHG Emissions Assessment (GHGA) – This evaluation estimates the GHG emissions generated by a project throughout its entire lifespan. It then compares these emissions against pertinent Irish carbon budgets, targets, and policies to help gauge their significance.; The Transport Infrastructure Ireland (TII) Carbon assessment tool and the Irish Green Building Councils (IGBC) Lifecycle Assessment Tool have been used for this assessment and
- Climate Change Risk Assessment (CCRA) – This analysis examines how a changing climate could affect a project and its surrounding environment. The assessment considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

Further details on the methodologies undertaken are presented in the following paragraphs.

11.5 Study Area

Effects arising from the potential impacts on climate are considered to impact on a national to EU to global level and the study area for climate is the State for both the construction and operation phases. The proposed Project has been outlined in Chapter 2.

11.6 Survey Methodology

11.6.1 Desk Surveys

A desktop study involving various national and international documents on climate change and analysis of synoptic meteorological data from the nearest Met Eireann station (Dublin Airport) was also carried out in order to compile this report. Attention has been focused on Ireland's obligations under the Paris Agreement in the context of the overall climatic impact of the presence and absence of the Proposed Development.

This analysis was undertaken by means of a desktop assessment based on available relevant guidance and information sources, and with reference to other chapters of this EIAR.

The following information sources have been consulted in relation to the assessment of climate aspects for the proposed Project:

- Key material, resource and cut/fill balance inputs from the description of the proposed Project presented in Project Description and Construction Strategy of this EIAR;
- Traffic figures from Traffic and Transportation;
- GHG assessment for pre-construction, construction and operational life stages;
- Building Lifecycle and Energy Report findings;
- Site Specific Flood Risk Assessment
- Estimates of likely waste volumes from the description of the proposed Project presented in Project Description, Construction Strategy, Land and Soils and Resource and Waste Management of this EIAR; and
- Environmental Protection Agency (EPA) GHG Emissions Inventories and Projections.

11.6.2 Climatics

<u>Summary of the Approach</u>

This DNV assessment was primarily based on the on-site climate risk projections generated CMIP5/CMIP6 climate model. The tool is typically used in combination with multiple Shared Socio-economic pathways/ Representative Concentration Pathways (SSPs/RCPs), which represent different future GHG concentration trajectories developed by the International Panel on Climate Change. The assessment was undertaken for two representative scenarios SSP1-2.6/RCP 4.5 and SSP5-8.5/RCP 8.5:

- SSP1-2.6/RCP 4.5 (transition from 2030) – this scenario leads to global warming exceeding 2 °C by 2100 but remaining below 3 °C. It is described as an intermediate scenario; and
- SSP5-8.5/RCP 8.5 (business as usual) – this scenario leads to global warming significantly exceeding 3 °C by 2100 and is generally taken as the basis for the worst-case climate change scenarios.

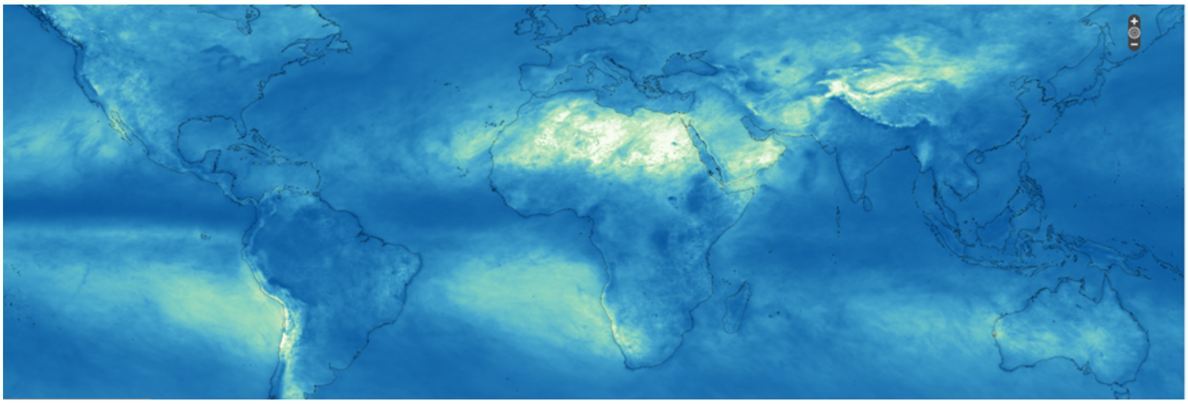

Figure 11.4- Multi-model Ensembled Rainfall Projection for 2050 (SSP5-8.5)

We combine the global data from multiple IPCC models (ACCESS, GFDL-ESM4, HadGEM) to address the model uncertainty. Figure 11-4 showcases the multi-model ensembled of rainfall projection for 2050 under SSP5-8.5 scenario. Through DNV's proprietary method, we downscale and refine the global data to a 5km grid resolution for various regions like Australia, Contiguous United States (CONUS), Europe, and the United Kingdom. Leveraging these refined datasets, we can assess multi-hazard risk exposure for assets and portfolios across different geographical areas.

Category	Hazard
Temperature related indices	Surface temperature
	Warm Days
	Fire Weather Days
	Heat Stress Index
Rainfall related extremes	Precipitation
	Heavy Precipitation Days
	Extreme Precipitation Days
	Flood Events
Aridity/Drought conditions	Water stress
Irradiance at surface	Surface reading solar radiation
Cloud related	Cloud cover
Wind extremes	Wind speed
	Storm wind speed
Subsidence and landslide	Subsidence susceptibility index
	Landslide
Hailstorm	Hailstorm frequency
Lightning	Lightning density

Table 11.1- Assessment of climate risk indices

11.6.3 Field Surveys

No site-specific baseline surveys were undertaken as part of the assessment for climate. The baseline data presented in this section is derived from the EPA Projections and Met Éireann monitoring network and may be taken as representative of the background climate within the Study Area.

11.6.4 Assessment Methodology

11.6.4.1 Key parameters for assessment

This assessment has been undertaken in line with the Institute of Sustainability & Environmental Professionals (ISEP formerly known as IEMA) guide 'Assessing GHG Emissions and Evaluating their Significance', 2nd Edition, 2022. The following aspects of the proposed Project are assessed in this chapter:

- Potential direct GHG (GHG) emissions associated with the construction of the proposed Project – this includes site clearance, embodied carbon, material transport, construction activities and waste management;
- Potential changes in GHG emissions associated with emissions during the operational phase of the proposed Project; and
- Vulnerability of both the construction and operational phases of the proposed Project to climate change.

11.6.4.2 GHG Appraisal Method -Construction Phase (Including Material Delivery and Spoil Removal)

The GHG assessment accounts for various components relating to the project during different life stages to determine the total impact of the development on climate. The building life expectancy for the purposes of the assessment is 50 years, typical for this type of development. GHG emissions are attributed to four main categories, taken from BS EN 15978. These categories are:

- Production Stage (Embodied carbon); The carbon emissions at this stage originate from the extraction of raw materials, their transportation to manufacturing sites, and the primary energy consumed (along with the associated carbon impacts) during the conversion of these raw materials into construction products. These phases have been included in the scope of this assessment, and relevant information has been integrated into the TII tool (TII, 2022).
- Pre-construction/Construction Stage; These carbon impacts stem from the delivery of construction products to the site and their subsequent processing and assembly into the building. This aspect has been incorporated into the assessment's scope.
- Operational Stage: This encompasses a broad range of sources, including GHG emissions from building operations (energy), maintenance, and replacement which have been included in this assessment.
- End of Life Stage: The sustainable deconstruction and disposal of the existing building at the end of its life (Approx 50 years) consider the activities carried out by demolition contractors on-site. However, no credit is given for potential future carbon benefits from reusing or recycling materials into new products. This stage is not included in the scope of this study due to the variability and uncertainty surrounding deconstruction methods that may be employed at the end of the development's lifespan.

Information and data from the building lifecycle report, building energy ratings and energy statement have been utilised for this chapter.

Nearly Zero Energy Buildings' (NZEB) means a building that has a very high energy performance. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby. Since 2020, all new buildings in the EU are required to be 'nearly-zero energy buildings'. This will be replaced by a further enhanced 'zero-emission buildings' requirement, starting from 2028 for new buildings owned by public bodies and 2030 for all other new buildings.

The Dwelling Energy Assessment Procedure (DEAP) is used by BER assessors to calculate the energy performance and carbon dioxide emissions of a home's space heating, water heating, ventilation and lighting. DEAP consists of a software tool and guidance manuals. BER Assessors use DEAP to publish Building Energy Rating (BER) certificates and advisory reports for homes. DEAP is also the compliance tool specified in Part L of the Irish Building Regulations.

The DEAP software is web-based and used to calculate the annual delivered energy consumption, primary energy consumption (kWh/m2/year) and carbon dioxide emissions (kgCO2/m2/y) for standardised occupancy. For all new builds, NZEB is equivalent to a 25% improvement in energy performance on the 2011 Building Regulations. Key changes to Part L for NZEB compliance include a Maximum Energy Performance Coefficient of 0.3, a Maximum Carbon Performance of 0.35 and a renewable Energy Ratio of 20%.

The project design team and OCSC Consulting Engineers (2026) have utilised the Irish Green Building Councils (IGBC) Carbon Designer tool for Ireland on this project. The Irish Green Building Council, in collaboration with One Click LCA Ltd., have developed the Carbon Designer for Ireland tool specifically for Irish building projects. Endorsed by the EPA and the Land Development Agency, this tool is compliant with standards such as EN 15978, ISO 21931–1, ISO 21929, and the data requirements of ISO 14040 & EN 15804. It is also aligned with LEED, BREEAM, and PAS 2080. The tool enables users to evaluate the carbon footprint of buildings in the early stages by using typical default materials and values. Users input details such as gross floor area, number of stories, and building frame type. After establishing a baseline with generic data, the tool facilitates the exploration of various options and the optimisation of carbon impacts. It identifies the most carbon-intensive elements within the building and suggests alternatives with lower carbon footprints. This provides a high-level initial assessment of the lifecycle carbon for the development based on basic information and default values with the option to edit these defaults as required to reduce impacts.

The primary factor in reducing climate impact is the extent of proposed mitigation. Thus, using construction materials with lower carbon intensity can help reduce climate effects. This assessment aims not for perfection but to identify areas with significant carbon impact. We can then explore potential mitigation measures to reduce this impact. Outputs from the IGCB tool have been reviewed and implemented where relevant to reduce the climate impact of the proposed development.

Transport Infrastructure Ireland's (TII) proprietary carbon tool has been used to quantify carbon emissions from non-building elements such as material delivery, spoil removal, roads, and infrastructure. The carbon tool is a spreadsheet-based product, developed by TII, with the goal of identifying, estimating and mitigating GHG emissions that accrue on large road and rail infrastructure projects. The carbon tool is closely aligned with guidance set out in PAS 20803 which suggests a modular structure for capturing and reporting carbon emissions according to lifecycle phase. Where the exact material needed isn't listed an estimate to a similar material type has been used. The construction waste and construction traffic information were reviewed from the traffic and waste chapters.

Design data for materials, earthworks and transport distances are based on input data from the design team. Where detailed designs are not available for various parts of the project, assumptions are made based on industry best practice and default values in the carbon tool. In particular, transport distances for materials have been estimated, as no specific suppliers have been selected at this early stage of the proposed Project. This allows for an estimate of transport emissions, using an emissions factor for kg CO2eq/km in the carbon tool.

The use of the TII Carbon Tool was not considered suitable for the building elements of the Proposed Development. As the TII Carbon Tool was developed for road and infrastructure projects, the material types within the tool are specific to these types of developments. These material types are not fully appropriate for assessing the embodied carbon associated with the construction of buildings. Therefore, the carbon impact of the buildings was carried out using an alternative tool; the Carbon Designer for Ireland tool. The IGBC lifecycle assessment tool in combination with BER/NEAP assessments have been used for the building and operational carbon assessment.

In addition to the measures outlined above, the GHG assessment has explicitly had regard to the Housing Agency's statutory report "Embodied Carbon and the Climate Impact of our Housing" (August 2025). This report highlights that embodied carbon—emissions arising from the extraction, manufacture, transport, and assembly of construction materials—can account for a substantial proportion of a dwelling's whole-life carbon footprint, particularly as operational emissions decline under NZEB standards. The report recommends early-stage design interventions, material efficiency, and circular economy principles as critical strategies for reducing embodied carbon. In line with these recommendations, the Proposed Development has incorporated whole lifecycle carbon assessment using the Irish Green Building Councils (IGBC) Lifecycle Assessment Tool, prioritised low-carbon material choices, and embedded reuse and recycling measures within the Construction Waste Management Plan as outlined in the preceding sections.

11.6.4.3 GHG Appraisal Method - Operational Phase

Traffic Emissions

As per the EU guidance document Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013) the climate baseline is first established by reference to EPA data on annual GHG emissions (see Section 11.7 below). Thereafter the impact of the Proposed Development on climate is determined. Emissions from road traffic associated with the Proposed Development have the potential to emit carbon dioxide ($CO2$) which will impact climate.

The UK Highways Agency has published an updated DMRB guidance document in relation to climate impact assessments LA 114 Climate (UK Highways Agency, 2019). The following scoping criteria are used to determine whether a detailed climate assessment is required for a proposed project during the operational stage. During the operational phase, if any of the road links impacted by the Proposed Development meet the below criteria then further assessment is required.

- A change of more than 10% in AADT;
- A change of more than 10% to the number of heavy duty vehicles; and
- A change in daily average speed of more than 20 km/hr.

None of the road links impacts by the Proposed Development satisfy the above criteria and a quantitative assessment of the impact of traffic emissions on climate is not necessary as there is no potential for significant impacts to climate.

Operational GHG Emissions

The EU guidance (2013) also states indirect GHG emissions as a result of a development must be considered, this includes emissions associated with energy usage. In addition to the EU guidance, the ISEP guidance note on 'Assessing GHG Emissions and Evaluating their Significance' (ISEP, 2022) states that "the crux of significance regarding impact on climate is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050". Mitigation has taken a leading role within the guidance compared to the previous edition published in 2017. Early stakeholder engagement is key and therefore mitigation should be considered from the outset of the project and continue throughout the project's lifetime in order to maximise GHG emissions savings.

The Sustainability Energy Statement prepared by OCSC, the building lifecycle report prepared by Aramark and the IGBC outputs in relation to this assessment has been reviewed and used to inform the operational phase climate assessment. This report outlines several measures in relation to energy usage from the Proposed Development primarily in relation to heat and electricity. Several measures have been incorporated into the overall design of the development to reduce the impact to climate where possible, in line with the objectives of the ISEP guidance (2022).

11.6.4.4 Assessment Criteria for GHG Emissions

After the publication of the 2021 Climate Amendment Act in July 2021 and the 2021 CAP, the carbon budgets were approved and a series of sectoral emissions ceiling were published, including sectoral emissions ceilings for the Residential sector which remain the same under CAP25 (DECC, 2021). These ceilings will allow a comparison with the net CO2 projected GHG emissions from the Project.

The IEMA Climate Change principles (ISEP, 2020) document provides a section on how to assess GHG emissions in EIA and states:

- "When evaluating significance, all new GHG emissions contribute to a significant negative environmental effect; however, some projects will replace existing development that have higher GHG profiles. The significance of a project's emissions should therefore be based on its net impact, which may be positive or negative.
- "Where GHG emissions cannot be avoided, the EIA should aim to reduce the residual significance of a project's emissions at all stages."
- "Where GHG emissions remain significant but cannot be farther reduced… approaches to compensate the project's remaining emissions should be considered."

The process for determining the significance of effects involves two key steps: first, defining the magnitude of the impacts, and second, evaluating the sensitivity of the receptors (e.g., Ireland's National GHG targets). Although there are no specific project criteria for climate assessment, the project will be evaluated using the recommended ISEP significance determination approach. This evaluation will account for any embedded or planned mitigation measures included in the project design (ISEP, 2020).

According to LA 114, professional judgment is essential when contextualizing and assessing the significance of a project's GHG impact. In alignment with ISEP Guidance, LA 114 emphasises that the core of assessing significance is not just whether a project emits GHGs or the magnitude of these emissions alone, but rather whether the project helps reduce GHG emissions compared to a baseline that aligns with a net zero trajectory by 2050 (UK Highways Agency, 2019).

Significance determination for emissions generated by the project in this assessment is based on the criteria presented in Table 11-2 as guided by ISEP in addition to the following two factors:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Magnitude of Impact	Description
Major or Moderate Adverse (i.e. significant)	A project that follows a 'business-as-usual' or 'do minimum' approach and is not compatible with the net zero trajectory by 2050 or sectoral based transition to next zero targets, results in a significant adverse effect. It is down to the consultant completing the assessment to differentiate between the 'level' of significant adverse effects, e.g. 'moderate' or 'major' adverse effects. A project's impact can shift from significant adverse to non-significant effects by incorporating mitigation measures that substantially improve on business-as-usual and meet or exceed the science-based emissions trajectory of ongoing but declining emissions towards net zero. Meeting the minimum standards set through existing policy or regulation cannot necessarily be taken as evidence of avoiding a significant adverse effect. This is particularly true where policy lags behind the necessary levels of GHG emission reductions for a science based 1.5°C compatible trajectory towards net zero.
Minor Adverse (i.e. not significant)	A project that is compatible with the budgeted, science based 1.5°C trajectory (in terms of rate of emissions reduction) and which complies with up-to-date policy and 'good practice' reduction measures to achieve an

	impact that has a minor adverse effect but is not significant. The project may have residual impacts but is doing enough to align with, and contribute to, the relevant transition scenario. A 'minor adverse' or 'negligible' non-significant effect conclusion does not necessarily refer to the magnitude of GHG emissions being carbon neutral (i.e. zero on balance) but refers to the likelihood of avoiding severe climate change and achieving net zero by 2050. A 'minor adverse' effect or better is a high bar and indicates exemplary performance where a project meets or exceeds measures to achieve net zero earlier than 2050.
Negligible	A project that achieves emissions mitigation that goes substantially beyond the reduction trajectory, or substantially beyond existing and emerging policy compatible with that trajectory, and has minimal residual emissions, is assessed as having a negligible effect that is not significant.
Beneficial	A project that achieves emissions mitigation that goes substantially beyond the reduction trajectory, or substantially beyond existing and emerging policy compatible with that trajectory, and has minimal residual emissions, is assessed as having a negligible effect that is not significant.

Table 11.2- Definition of Climate Significance

Ireland's carbon budgets provide a framework for understanding the significance of GHG emissions from the Proposed Development. This involves comparing the anticipated net GHG emissions of the development with the established carbon budgets. With the introduction of the Climate Action Act in 2021 and the Climate Action Plan 2025, sector-specific carbon budgets have been outlined for comparison with the development's net GHG emissions over its lifecycle. For the Transport sector, which emitted approximately 12 MtCO2e in 2018, the budget has a 2030 cap of 6 MtCO2e, reflecting a 50% reduction. Similarly, the Industry sector, with 2018 emissions of about 7 MtCO2e, has a 2030 ceiling of 4 MtCO2e, indicating a 35% reduction (see Table 11-4).

11.6.4.5 Climate Change Risk Assessment-Criteria for Climate Vulnerability

Climate change risk assessment is a risk assessment-based methodology for identifying potential climate impacts and assessing their severity. Carrying out a climate change risk assessment, at the simplest level, can be summarised into the following steps:

- identifying potential climate change risks to a scheme or project.
- assessing these risks (potentially prioritising to identify the most severe); and
- formulating mitigation actions to reduce the impact of the identified risks.

Any assessment of risk includes assessing the likelihood (or probability) and magnitude (or severity) of the impacts identified. This method is widespread within the climate change resilience assessments carried out by projects and cities to date.

The risk assessment assesses the likelihood and consequence of the impact occurring to each receptor, leading to the evaluation of the significance of the impact and the vulnerability of the Proposed Development to various climate hazards. The vulnerability is determined by combining the sensitivity and the exposure of the Proposed Development to various climate hazards.

To evaluate the likelihood of climate risk, we have utilised the baseline environmental information provided in Section 11.2, future climate change models, and insights from other experts involved in the Proposed Development (e.g., hydrologists and traffic consultants).

Initially, a preliminary screening/vulnerability assessment Climate Change Risk Assessment (CCRA) focusing on the operational phase is performed, following the TII guidance PE-ENV-01104 (2022). This involves assessing the sensitivity of the development assets (i.e., receptors) and their exposure to climate change hazards. Each asset category within the Proposed Development must be assigned a level of sensitivity to climate hazards. PE-ENV-01104 outlines the asset categories and climate hazards that should be considered.

The specific asset categories will differ depending on the type of development and need to be determined on a case-by-case basis.

- **Asset Categories** Pavements; drainage; structures; utilities; landscaping; signs, light posts, buildings, and fences.
- **Climate Hazards** Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

The sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below.

- **High Sensitivity** The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity score of 3.
- **Medium Sensitivity** It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2.
- **Low Sensitivity** It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified, the exposure analysis can be completed. The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type for example: flooding could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria.

- **High Exposure** It is almost certain or likely this climate hazard will occur at the project location i.e. might arise once to several times per year. This is an exposure score of 3.
- **Medium Exposure** It is possible this climate hazard will occur at the project location i.e. might arise a number of times in a decade. This is an exposure score of 2.
- **Low Exposure** It is unlikely or rare this climate hazard will occur at the project location i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability i.e. climate screening.
Vulnerability = Sensitivity x Exposure.

The vulnerability assessment takes any proposed mitigation into account. Table 11-3 details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale. Where residual medium or high vulnerabilities exist, the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks.

According to TII guidance and EU technical guidance, if all identified vulnerabilities are reasonably ranked as low, a detailed climate risk assessment may not be necessary i.e. it is screened out. In such cases, the impact of climate change on the development would be deemed insignificant.

However, if there are residual medium or high vulnerabilities, a more detailed climate change risk assessment may be required, along with the implementation of additional mitigation measures to address the risks. The TII guidance specifies that a construction phase Climate Change Risk Assessment (CCRA) is only required if a detailed CCRA is deemed necessary.

	Exposure			
Sensitivity		High (3)	Medium (2)	Low (1)
	High (3)	9- High	6- High	3- Medium
	Medium (2)	6- High	4- Medium	2- Low
	Low (1)	3- Medium	2- Low	1- Low

Table 11-3- Vulnerability Matrix

The vulnerability conclusions for each impact are based on, and incorporate, confirmed design and mitigation measures. Where the assessment concludes that the impact remains high, the project team may need to identify additional adaptation/EIA mitigation measures.

The screening CCRA (vulnerability assessment), detailed in Section 11.10.4.2, did not identify any residual medium or high risks to the Proposed Development as a result of climate change. Therefore, a detailed CCRA for the construction and operational phase were scoped out.
While a CCRA for the construction phase was not required, best practice mitigation against climate hazards is still recommended in Section 11.11.

11.6.5 Difficulties Encountered/ Limitations

Difficulties were encountered during the quantification of materials at the design stage in order to assess the embodied construction carbon. The exact volumes of materials, location of waste disposal sites, sourcing of products and technical specification for materials are finalised during the detailed design phase and by the appointed contractor. Throughout the assessment, efforts have been made to provide the most likely scenario of the embodied carbon assessment. Where it is required to make assumptions as the basis of the assessment presented here, these assumptions are based on advice from competent project designers and are clearly outlined within the chapter.

11.7 Receiving Environment

Climate refers to the average weather conditions over a period of time, typically 30 years, while climate change denotes a substantial alteration in these average conditions. Although climate change can occur naturally, human activities in recent years have accelerated its pace through the emission of Greenhouse Gases (GHGs), as noted by the IPCC in 2015. These anthropogenic GHGs are changing the composition of the Earth's atmosphere, leading to an enhanced 'Greenhouse Effect.' This effect increases the atmosphere's capacity to trap heat, resulting in a rise in average global temperatures over the past four decades. The burning of fossil fuels, which releases significant amounts of carbon dioxide (CO_2), has been and remains a major contributor to this enhanced greenhouse effect. The most critical GHGs include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O).

Global climate change refers to the long-term shift in temperature and weather patterns on Earth, primarily driven by human activities such as burning fossil fuels, deforestation, and industrial processes. These activities increase the concentration of greenhouse gases in the atmosphere, enhancing the greenhouse effect and leading to a rise in average global temperatures. This warming impacts natural systems, causing more frequent and severe weather events, melting polar ice, rising sea levels, and disruptions to ecosystems and biodiversity. The effects of climate change are profound, affecting agriculture, water resources, health, and the economy, necessitating urgent and sustained efforts to mitigate and adapt to these changes.

Ireland is also experiencing the impacts of a changing climate with the rise in the annual surface air temperature by 0.8% since 1900. In addition to temperature, we are seeing increased rainfall and sea-level rise and observing changes in the frequency of extreme weather like storms, flooding, and drought (EPA, 2023). Examples of extreme weather would be Storm Ophelia in 2017 and the Beast from the East in 2018 to name two of the most impactful.

11.7.1 Current Baseline

11.7.1.1 Existing GHG Emissions Baseline

Ireland's latest publicly available greenhouse gas (GHG) emissions from 1990-2024 are based on SEAI's provisional energy balance released in June 2025 (EPA, 2025). In 2024, total national GHG emissions (excluding LULUCF) are estimated at 53.75 Mt CO_2eq, which is 2.0% lower (1.09 Mt

CO2eq) than in 2023 (54.85 Mt CO2eq), following a 6.8% decrease in emissions reported for 2023. Emissions in 2024 are 3.6% lower than the 1990 baseline—the first such drop in 33 years. National total emissions including Land Use Land Use Change and Forestry (LULUCF) decreased by 1.9% to 57.65 Mt CO2eq. ETS4 and ESR emissions fell by 7.4% and 0.5% respectively (EPA, 2025).

Climate impacts are evaluated at a national level, considering national targets and sectoral emission ceilings. The study area for climate assessments is the Republic of Ireland, with the baseline established in the context of this geographic focus.

In 2023 emissions in the stationary ETS1 emissions decreased (17%) and emissions under the ESR (Effort Sharing Regulation) decreased (3.4%). When LULUCF is included, total national emissions decreased by 3.8% (EPA, 2025).

Decreased emissions in 2023 compared to 2022 were observed in the largest sectors except for transport which showed an increase of 0.3% shown highlighted red in the "Emissions change 2022-2023" Table 11-4 below (EPA, 2025). Climate impacts are evaluated at a national level, considering national targets and sectoral emission ceilings. The study area for climate assessments is the Republic of Ireland, with the baseline established in the context of this geographic focus. The table shows that the residential sector accounted for 5.3% of emissions in 2023.

Mt CO_2 eq	**2022**	**2023**	**% Change**
Agriculture	21.782	20.717	-4.9%
Transport	11.759	11.798	0.3%
Energy Industries	10.003	7.860	-21.4%
Residential	5.753	5.347	-7.1%
Manufacturing Combustion	4.356	4.152	-4.7%
Industrial Processes	2.294	2.155	-6.1%
F-Gases	0.719	0.675	-6.0%
Commercial Services	0.734	0.715	-2.6%
Public Services	0.690	0.671	-2.7%
Waste	0.870	0.844	-3.0%
LULUCF	3.655	3.895	6.5%
Total excluding LULUCF	**58.960**	**54.934**	-6.8%
Total including LULUCF	**62.616**	**58.829**	-6.0%

Table 11-4- Emissions change 2022-2023 Ireland.

Emissions per capita decreased from 11.31 tonnes CO_2eq/person in 2022 to 10.34 tonnes CO_2eq/person in 2023. Ireland's average tonnes of GHG/capita over the last ten years were 12.08 tonnes. With CSO 2023 census data showing a population of 5.28 million people and with population projected to increase to 5.67 million in 2030, 6.05 million in 2040 and 6.33 million by 2050, per capita emissions need to reduce significantly. At current per capita emission levels, each addition 500,000 people would contribute an additional 5 million tonnes of CO_2eq annually.

The EPA also publishes GHG emission projections to 2055. Table 11-5 shows that in the WAM scenario the percentage reduction is not achieved for electricity, transport, industry, agriculture and other (comprises of waste, fluorinated-gases and petroleum refining). Looking at the overall percentage emissions reduction target of -51% by 2030 compared to 2018, the projections are indicating a significant shortfall with only a -29% reduction achieved thus predicting that Ireland will not achieve its legally binding climate target (EPA, 2024).

Sector	Emissions 2018 (Mt CO_2eq)	Projected Emissions 2030 (Mt CO_2eq)	Percentage Change 2030 vs 2018	Target Reduction 2030 vs 2018	Percentage Change (Reported in 2024) 2030 v 2018
Electricity	10.2	3.1	-0.7	-75%	-0.66
Transport	12.3	9.7	-0.21	-50%	-0.29
Buildings (Residential)	7	5.4	-0.22	-40%	-0.4
Buildings (Commercial & Public)	1.5	1	-0.36	-45%	-0.6
Industry	7	6.1	-0.12	-35%	-0.24
Agriculture	21.4	18	-0.16	-25%	-0.18
Other	2.1	1.6	-0.25	-50%	-0.25
LULUCF* *(no ceiling currently)*	4	5.5	0.39	N/A	0.17
Total with LULUCF	65.6	50.6	-0.23	-51%	-0.29

**A direct comparison of emissions in the Agriculture sector against its Sectoral Emission Ceilings is no longer viable.*
*** Waste, F-gases and Petroleum Refining*
****National objective includes LULUCF*

Table 11.5- Assessment of Achievement of Sectoral Percentage Targets under the With Additional Measures scenario (EPA)

11.7.2 Future GHG Baseline

In line with TII and ISEP Guidance the future baseline is a trajectory towards net zero by 2050, "whether it [the project] contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050" (ISEP, 2022). Formerly known as the Institute of Environmental Management and Assessment (ISEP), now rebranded as the Institute of Sustainability and Environmental Professionals (ISEP).

The future baseline for GHG emissions assessment will be considered in relation to the future Irish climate targets which the assessment results will be compared against.

The future baseline will be based on Ireland achieving the targets outlined in the Climate Action Plan 2025 (CAP25) and subsequent Climate Action Plans, as well as meeting binding EU targets for 2030. In order to meet the commitments under the Paris Agreement, the European Union (EU) enacted '*Regulation (EU) 2018/842 on binding annual GHG emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013*' (hereafter referred to as the Regulation). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. The Regulation was amended in April 2023 and Ireland must now limit its GHG emissions by at least 42% by 2030. The ETS is an EU-wide scheme which regulates the GHG emissions of larger industrial emitters Including electricity generation, cement manufacturing and heavy industry. The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and thus includes GHG emissions from transport, residential and commercial buildings and agriculture.

11.7.3 Current CCRA Baseline

Impacts to the proposed Project as a result of climate change involve increases in temperatures and increases in the number of rainfall days per year. Ireland has observed increases in the annual rainfall in the north and west of the country, with small increases or decreases in the south and east including in the region where the proposed Project will be located. The EPA (2021) has compiled a list of potential adverse impacts as a result of climate change including the following which may be of relevance to the proposed Project:

- Increase of 1 to 4 degrees Celsius in average temperature;
- More intense storms and rainfall events;
- Increased likelihood and magnitude of river and coastal flooding;
- Water shortages in summer in the east;
- Adverse impacts on water quality; and
- Changes in distribution of plant and animal species

The proposed Project area experiences a temperate, maritime climate, resulting in mild winters and cool summers. The Met Éireann weather station at Dublin Airport, County Dublin, is the nearest weather and climate monitoring station to the proposed Project that has meteorological data recorded for the 30-year period from 1991 to 2020 (Met Eireann, 2023). The monitoring station is located approximately 18km west of the proposed Project at its nearest point (Blackrock). Meteorological data recorded at Dublin Airport, over the 30-year period from 1991 to 2020 indicates that the wettest months were October and November, and the driest month on average was March. July was the warmest month with a mean temperature of 19.5°C.

Met Éireann recent weather patterns were analysed, they highlight a marked rise in both the frequency and intensity of storms. Notable examples include Storm Darwin in February 2014, Storm Emma in March 2018, Storm Ophelia in October 2018 and Storm Eowyn in January 2025.

Annual rainfall from 1981 to 2010 was 1.91% lower compared to the 30-year period from 1991 to 2020. As rainfall has increased in Ireland, recent years have seen more intense historical precipitation events, such as the heavy rainfall and flooding in the summer of 2008, severe flooding in November 2009, and the heavy rainfall in the Greater Dublin Area on 24 October 2011. The latest data from Met Éireann's 'The Status of Irish Climate 2020 Report' highlights that the 10-year period from 2006-2015 was the wettest recorded decade (Met Eireann, 2021).

Met Éireann's 2024 Climate Statement states 2024's average shaded air temperature in Ireland is provisionally 10.72 °C, which is 1.17°C above the 1961-1990 long-term average. This makes 2024 the fourth warmest year on record, 0.49 °C cooler than 2023, the warmest year on record. The five warmest years on record are 2023, 2022, 2007, 2024 and 1945. Seven of the top ten warmest years have occurred since 2005. (Met Eireann, 2024).

In 2024, Ireland experienced below-average rainfall, including the warmest May on record. Since April 2023, record-high sea surface temperatures (SST) were observed, with a severe marine heatwave affecting the western coast of Ireland in June 2023. This marine heatwave contributed to the unprecedented rainfall in July 2023 (Met Eireann, 2024).

Recent weather patterns and extreme weather records from Met Éireann have been examined. Given the exceptional data from 2023 and 2024, Met Éireann notes that current Irish climate projections predict continued warming, including milder winters. The record temperatures increase the likelihood of extreme weather events, leading to longer dry periods and heavier rainfall. Additionally, sea level rise is expected to cause more storm surges and coastal flooding, with an increase in compound events where coastal surges and extreme rainfall occur simultaneously. While Met Éireann is confident that maximum rainfall rates will rise, there is less certainty about how the frequency or intensity of storms will change with climate change.

Surface air temperature plays a crucial role in climate analysis, influencing ecosystems, livelihoods, and human activities. Changes in temperature affect various sectors, including health, agriculture, and energy demand. In Ireland, over a century of consistent temperature measurements is available. Globally, the average surface air temperature has increased by 0.85°C over the past 100 years, with the rate of warming nearly doubling since 1975, reaching an equivalent of a 1.65°C rise per century. The five warmest years on record globally are now 2020 through 2024, with 2024 confirmed as the warmest year ever recorded since temperature monitoring began in the late 1800s. This marks a dramatic continuation of the warming trend observed over the past decade, with all ten of the warmest years occurring since 2015 (Met Éireann 2025).

11.7.4 Planning Baseline Context

A previous planning permission relating to the St Teresa's lands forms part of the established planning baseline for this assessment. In 2019, permission was granted under SHD ABP-303804-19 for a residential scheme comprising 291 units on the site. This permitted development is considered part of the existing planning context for the purposes of the Climate baseline. The 2019 permission also informs the reference scenario against which the uplift associated with the current proposal is assessed.

11.7.5 Future CCRA Baseline

The EPA-funded research project 'Ensemble of Regional Climate Model Projections for Ireland Report No. 159' (EPA 2015) forecasts significant reductions in mean annual, spring, and summer precipitation, with longer dry spells expected. By 2050, the most pronounced decreases are projected for summer, with reductions ranging from 0% to 13% under medium-to-low emission scenarios and 3% to 20% under high emission scenarios. In contrast, heavy precipitation during winter and autumn is expected to increase by up to 20%. Additionally, the number of extended dry periods during autumn and summer is anticipated to rise considerably by mid-century.
The report suggests that the total number of North Atlantic cyclones is expected to decrease by 10%, along with a reduction in average mean sea-level pressure of 1.5 hectopascals (hPa) across all seasons by mid-century. Wind energy is anticipated to decline in spring, summer, and autumn, with an increase expected in winter. Additionally, the predicted rise in extreme storm activity could negatively impact future wind energy supply.

The EPA's State of the Irish Environment Report (Chapter 4: Climate Change) further highlights that projections indicate that the comprehensive implementation of additional policies and measures from the 2019 Climate Action Plan could reduce Ireland's total GHG emissions by up to 25 percent by 2030 compared to 2020 levels. Climate change is already a current issue in Ireland, with a temperature increase of approximately 0.8°C since 1900. The report further highlights the importance of strong public sector climate leadership and the rapid acceleration of decarbonisation efforts if we are to halt the climate crisis (EPA, 2024).

Accurate climate projections are a key scientific input for national policymakers when planning for, and adapting to, the challenges posed by climate change. Climate projections are produced using climate models, which have been developed by scientists over recent decades and are capable of simulating Earth's past, present, and future climate. Global Climate Models (GCMs) are used to model the global impacts on Earth's climate of increasing GHG concentrations in the atmosphere at a resolution of ~50km or coarser. Regional Climate Models (RCMs) are used to capture key small-scale atmospheric features on the scale of 1-10km, such as local convection and wind gusts. Multi-model ensembles are often used in climate prediction studies to quantify associated model uncertainty.

RCMs utilise the output of GCMs and model regional climates at higher spatial resolutions; this process is known as dynamic downscaling. This approach allows key climate variables to be modelled more precisely, including precipitation; near-surface temperature; and the number and intensity of low-pressure systems. Low pressure systems are the primary driver of precipitation and wind affecting the country; therefore, the added value of RCMs in the modelling of low-pressure systems is of particular importance for Ireland.

Concentration trajectories known as Representative Concentration Pathways (RCPs) were utilised in EPA Research Report No.339 High resolution Climate Projections for Ireland – A Multi-model Ensemble Approach (EPA 2020). For the EPA study, two RCPs were chosen, RCP4.5 and RCP8.5. RCP4.5 is considered an intermediate scenario, while RCP8.5 is considered to be representative of a potential worst-case scenario. This is the only available climate projection data for Ireland which has been developed for policy makers, and is steered by DECC, the EPA, Met Eireann, and the LA CAROs.

The future climate was modelled using both the Representative Concentration Pathway 4.5 (RCP4.5) (medium-low) and RCP8.5 (high) scenarios. The study suggests that by mid-century (2041–2060), average annual temperatures are projected to rise by 1–1.2°C under RCP4.5 and 1.3–1.6°C under RCP8.5, with the most significant increases in the east. Temperature extremes are expected to become more pronounced, with summer daytime and winter night-time temperatures increasing by 1–2.4°C. The number of frost and ice days is projected to decrease by approximately 50%. Summer heatwaves are likely to become more frequent, especially in the south. Additionally, precipitation is expected to become more variable, with a significant increase in both dry periods and heavy rainfall events.

Established in June 2022, the National Framework for Climate Services (NFCS) aims to streamline the provision of climate services in Ireland and will be led by Met Éireann. The NFCS is designed to facilitate the co-production, delivery, and utilization of precise, actionable, and accessible climate information and tools to enhance climate resilience planning and decision-making. In parallel with the NFCS, ongoing research is being conducted through the TRANSLATE project. This initiative, led by climate researchers from the University of Galway's Irish Centre for High End Computing (ICHEC) and University College Cork's SFI Research Centre for Energy, Climate, and Marine (MaREI), with support from Met Éireann climatologists, is focused on advancing climate science. TRANSLATE generates outputs using internationally reviewed models from CORDEX and CMIP5, with Representative Concentration Pathways (RCPs) offering a range of possible futures based on different human activity scenarios.

TRANSLATE offers the first standardised and bias-corrected national climate projections for Ireland, designed to support climate risk decision-making across various sectors, such as transport, energy, and water. The bias correction means that users can use the data directly (which is not always possible).

It provides insights into potential changes in Ireland's climate under global temperature increases of 1.5˚C, 2˚C, 2.5˚C, 3˚C, or 4˚Cs. These projections generally align with previous forecasts for Ireland. The country's climate is heavily influenced by the Atlantic Meridional Overturning Circulation (AMOC), a major system of ocean currents, including the Gulf Stream, which features a northward flow of warm water and a southward flow of cold water. This system prevents Ireland from experiencing the extreme temperatures seen in other countries at similar latitudes. Recent studies suggest that the AMOC may weaken by 30–40% by 2100, leading to cooler North Atlantic Sea Surface Temperatures (SSTs). Despite this, Ireland is expected to continue warming, though the cooling effect of the AMOC might moderate the warming relative to continental Europe. Additionally, a weakened AMOC is anticipated to contribute to further sea level rise around Ireland. Climate change will cause significant shifts in temperature and rainfall patterns: average summer temperatures could rise by more than 2°C, summer rainfall could decrease by 9%, and winter rainfall could increase by 24%. Future projections also include a tenfold rise in the frequency of summer nights with temperatures exceeding 15°C by the end of the century, a decrease in the frequency of cold winter nights, and an increase in heatwaves. In Ireland, a heatwave is defined as a period of five consecutive days with daily maximum temperatures above 25°C.

11.7.6 Evolution of the environment in the absence of the project

Annex IV of the EIA Directive sets out the information required to be included in an EIAR. This includes:
"a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the Proposed Project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge".

In the event that the proposed Project does not proceed, an assessment of the future baseline conditions has been carried out and is described within this section. In the "do-nothing" scenario the interventions for the construction of the proposed development will not have taken place. As the site is zone for predominately residential use with a small area under the open space and amenities zoning, in the absence of the proposed development, it is likely that a development of a similar nature is likely to be constructed in the future in line with national policy and the development plan objectives. Therefore, the construction and operational phase impacts outlined in this assessment are likely to occur in the future, even in the absence of the proposed development.

There is potential for indirect positive impact to climate from the proposed Project. The absence of the proposed development means that the specific predicted GHG emissions, as well as any associated reductions and local climate benefits (such as improved building energy ratings, new transport infrastructure, or enhanced flood resilience), would not materialize at this time.
In summary, while the "do-nothing" scenario avoids the immediate climate impacts of construction and operation, it does not preclude future development. The evolution of the environment will continue to be shaped by planning policy, and similar climate-related impacts are likely to arise in the future, even in the absence of the current proposal.

11.8 Climatics Multi-Climate Hazard Analysis for the Proposed Development Location (Coordinates: 53.2976, -6.1724)

Under each scenario, nine categories of climate risk indices (20+ hazards) were assessed. The findings and recommendations are summarised in the following table. For the key indices, both the chronic risk (average trend) and acute risk (extremes) are provided. For example, the change in mean temperature and fire weather days are introduced in the temperature-related indices, as temperature is considered as the most relevant impact factor for climate change on asset resilience.

Category	Summary	Exposure Level
Cloud Related	Cloud Cover Historic average cloud cover in the area was 77.58%. This is projected to decrease to 76.95% (-0.62%) under SSP1-2.6 and 75.93% (-1.64%) under SSP5-8.5 for 2050.	4
Drought And Floods	Flood Events The historic inundation of 100-yr flood event is 0.00 m. This is projected to 0.00 m (0%) under SSP1-2.6 and 0.00 m (0%) under SSP5-8.5 for 2050.	1
	Water Stress The water stress index ranges from 1 to 5, with 1 indicating low stress and 5 indicating high stress. The historic water stress is rated as 2.00. And this is projected to increase to 3.00 under SSP1-2.6 and 2.00 under SSP5-8.5 for 2050	2
Hailstorm	Hailstorm Frequency Historical hailstorms in this location were 0.11 events/year.	n/a
Heat Stress	Heat Stress Index The historic heat stress index in the area is 12.53. And this is projected to increase to 13.80 under SSP1-2.6 and 14.37 under SSP5-8.5 scenarios for 2050.	2
Irradiance At Surface	Surface Reaching Solar Radiation	2

	The surface reaching solar radiation in the area was historically 122.23 W/m² and this is projected to increase to 128.37 W/m² under SSP1-2.6 and 126.76 W/m² under SSP5-8.5 for 2050.	
Lightning	Lightning Density The historic lightning density in the area was 0.01 event/1000km2/year.	n/a
Rainfall Related	Annual Max. 1-Day Precipitation Historic annual maximum 1-day precipitation in the area was 35.38 mm. This is projected to increase to 37.24 mm under SSP1-2.6 and 38.46 mm under SSP5-8.5 for 2050.	4
	Annual Max. 5-Day Historic annual maximum 5-day precipitation in the area was 65.24 mm. This is projected to increase to 72.58 mm under SSP1-2.6 and 70.89 mm under SSP5-8.5 for 2050.	4
	Extreme Precipitation Precipitation over 99% quantile is defined as extreme precipitation. The historic average extreme precipitation is 61.25 mm for a year and this is projected to increase to 76.76 mm (+25.32%) under SSP1-2.6 and 74.24 mm (+21.21%) under SSP5-8.5 for 2050.	4
	Heavy Precipitation Days Precipitation over 10mm is defined as heavy precipitation. The historic average heavy precipitation days in the area was 24.80 days in a year. This is projected to increase to 26.17 days under SSP1-2.6 and 26.90 days under SSP5-8.5 for 2050.	5
	Average Annual Precipitation Historic average precipitation in the area was 1003.00 mm/year. This is projected to increase to 1006.64 mm/year under SSP1-2.6 and 1006.80 mm/year under SSP5-8.5 for 2050.	5
Subsidence And Landslide	Landslides The historic landslide in the area is 0.00.	n/a
	Subsidence Susceptibility Index Subsidence susceptibility index ranges from 1-6, as very low, low, medium low, medium high, high, very high. The historic subsidence susceptibility index in the area is 3.00 and is projected to be 0.00 for 2040.	n/a
Temperature Related	Cold Days The historic cold days in the area were 7.57% per year. This is predicted to decrease to 2.84% under SSP1-2.6 and 1.38% under SSP5-8.5 for 2050.	1
	Days >35°C The historic days above 35°C in the area were 0.00 days per year. This is predicted to increase to 0.00 days under SSP1-2.6 and 0.00 days under SSP5-8.5 for 2050.	1
	Days >40°C The historic days above 40°C in the area were 0.00 days per year. This is predicted to 0.00 days under SSP1-2.6 and 0.00 days under SSP5-8.5 for 2050.	1
	Fire Weather Days The historic fire weather days in the area were 22.28 days per year. This is predicted to increase to 32.90 (+47.65%) days under SSP1-2.6 and 39.55 (+77.51%) days under SSP5-8.5 for 2050.	3
	Mean Temperature The historic mean annual temperature in the area is 9.80°C. This is projected to increase to 10.77°C (+0.97°C) under SSP1-2.6 (optimistic) and 11.30°C (+1.50°C) under SSP5-8.5 (business as usual or pessimistic scenario) for 2050.	3
	Warm Days Warm day are defined as when the maximum temperature is beyond 90% percentile. The historic warm days in the area are 13.97% per year and this it projected to increase to 29.62% under SSP1-2.6 and 36.40% under SSP5-8.5 scenarios for 2050.	4
Wind Related	Storm Wind Speed The historic storm wind speed of the area is 16.16 m/s and this is predicted to be decrease to 15.67 m/s (-3.05%) for SSP5-8.5 scenario for 2050.	3

	Wind Speed Historic average wind speed in the area was 5.70 m/s. This is projected to be 5.47 m/s under SSP1-2.6 and 5.56 m/s under SSP5-8.5 for 2050.	5

Table 11-6- Assessment of climate risk indices at the Proposed Development Location

11.9 Characteristics of the Proposed Development

Chapter 2 of this EIAR includes a detailed description of the Proposed Development. The proposed site layout is also detailed in Appendix 1-1. Impacts to climate will occur during both the construction and operational phases of the developments.

During the construction stage the main source of climate impacts will be as a result GHG emissions and embodied carbon associated with construction materials and construction activities for new buildings.
During the operational phase vehicle emissions from traffic accessing the site and energy use for space heating, hot water, lighting and electrical devices have the potential to release carbon dioxide (CO2) and other GHGs which will impact climate.

In addition, the vulnerability of the Proposed Development in relation to future climate change must be considered during the operational phase.

11.10 Potential Impact of the Proposed Development

During both the construction and operational phases of the development, there is potential for various greenhouse gas emissions to be released into the atmosphere. According to TII guidance, the significance of these GHG emissions on the climate is evaluated based on the total emissions across all stages of the Proposed Development.

11.10.1 Construction Stage GHG Assessment

The TII Carbon toolkit was utilised to quantify the construction phase embedded carbon for the Proposed Development. This toolkit can quantify carbon in infrastructure projects using Ireland-specific emission factors and data. Detailed project information including tonnage of materials was obtained from the Engineering Design Team.

The project design team have also utilised the Irish Green Building Councils (IGBC) Lifecycle Assessment Tool. This provides a high-level initial assessment of the lifecycle carbon for the development based on basic information and default values with the option to edit these defaults as required to reduce impacts.

GHG emissions have been quantified for all aspects of the construction phase including the following stages:

- Production stage: Embodied carbon is the carbon contained within a material or product. It is the sum of all carbon emissions that have been generated during the extraction, processing, and manufacturing of a particular product. Mitigation will be required as part of the demolition works to reduce the embodied carbon impact. Where possible demolished materials will be re-used on site or sent to a suitably licenced waste facility for re-use on other sites. Brickwork, concrete, steel and glazing are materials which have the potential for very high embodied carbon but also have the potential for recovery or recycling. Areas for demolition have been outlined in the D1- Demolition Plan accompanying this application. Where possible materials arising from demolition works will be reintegrated for as long as technically viable, as outlined in section 4 of the Energy and Sustainability Report 2025. If unsuitable for reuse they will be salvaged and re-used off site by providing them to a salvage merchant.

- Transportation to site: emissions associated with the carbon miles of the project materials. The impact of transporting materials from factory/source to site to facilitate construction is reported separately. A series of assumptions are made about the variables that impact transport emissions (material density, vehicle type, vehicle capacity and distance travelled) and assuming that the material may be transported from sources locally within 50km, regionally within 100km and nationally within 250km;

- Site Operations/Construction activities:
    - Site clearance emissions associated with plant and machinery required to clear the site. The carbon tool has a range of assigned land use categories for estimating site clearance. Different land use types have higher or lower carbon intensity for site clearance, which is linked to the energy required to clear the site.
    - Emissions arising from excavation activities based on the energy used in excavation activities. Energy expenditure varies depending on the type of ground to be excavated, e.g., rock excavation is much more energy intensive than topsoil excavation;
    - Construction activities cover carbon emissions generated during the construction of the proposed Project based on the scale and duration of the project; and
    - The generation of waste during the construction phase has potential for climate impact and the nature and scale of this impact depends on the type and volume of waste generated coupled with the nature of the waste treatment (reuse, recycling, recovery or disposal).
- Material replacement & refurbishment: Ongoing material refurbishment and replacement throughout the lifetime of the development is included within this stage of the GHG assessment these are default values based on the typical maintenance requirements for the chosen material types over the assumed 50-year lifetime

The results of the assessment of the above stages using the TII and Irish Green Building Councils (IGBC) Lifecycle Assessment Tool are presented in Table 11-7 and Figure 11-5. The results indicate that the total GHG emissions generated as a result of the construction of the proposed Project are 28,033,000 kg of CO2eq (28,033 tonnes CO2eq).

The carbon assessment has identified hotspots for embodied carbon emissions, particularly those associated with building materials. These emissions have been calculated using standard default materials for different building types within the tool, as detailed material information was not available at this stage of the project. Additionally, the average material types from the TII Carbon Tool were utilised for this assessment due to the lack of more specific information.

As anticipated construction materials represent the largest portion of carbon emissions for the Proposed Development, constituting about 78% of the total embodied carbon emissions during the construction phase across the different buildings. The highest carbon impact is observed in the external walls, beams, floors, and roofs, based on the standard default values and assumptions used in the carbon calculations. The rest of the construction phase's embodied carbon emissions come from transportation to the site, site operations, and material replacement.

The total embodied carbon for the construction phase, including the maintenance and replacement of materials throughout the development's lifetime, has been calculated at 28,033 tonnes CO2e (see Table 11-7). Since the overall GHG emissions from the development cannot be directly compared to a single sector's 2030 carbon budget, the emissions are categorised into different assessment areas. These categories must be individually compared to the relevant sectoral emissions budgets, as outlined in Table 11-7. For the Proposed Development, the applicable sectoral emissions budgets include those for Industry Buildings (Residential), Transport, and Waste. The projected emissions for the development are annualised over an assumed 50-year lifespan and then compared to the relevant sector's 2030 carbon budgets. This annualization process facilitates a proper comparison with annual GHG targets.

Stage	GHG Assessment Category	Predicted GHG Emissions (tCO_2e)	Relevant Sector for Cabron Budget Comparison	Annualised GHG Emissions as % of Relevant Cabron Budget
Production Stage	Materials	21,870	Industry	0.01%
Transportation to site	Material Transport	434	Transport	0.0001%
Site Operations/ Construction activities	Clearance and demolition	202	Industry	0.0001%
Site Operations/ Construction activities	Excavation	26	Industry	0.00001%
Site Operations/ Construction activities	Construction Worker Travel to Site	110	Transport	0.00004%
Site Operations/Construction activities	Construction Fuel Use	2,959	Industry	0.001%
Site Operations/ Construction activities	Construction Waste Disposal	40	Waste	0.00008%
Site Operations/ Construction activities	Construction Waste Transport	1	Transport	0%
Material replacement & refurbishment	Maintenance Material	2,392	Industry	0.001%
Total		28,033 tCO_2e		

Note 1 Project lifespan assumed 50 years for calculation purposes in line with best practice

Table 11.7- Construction Phase Greenhouse Gas Emissions

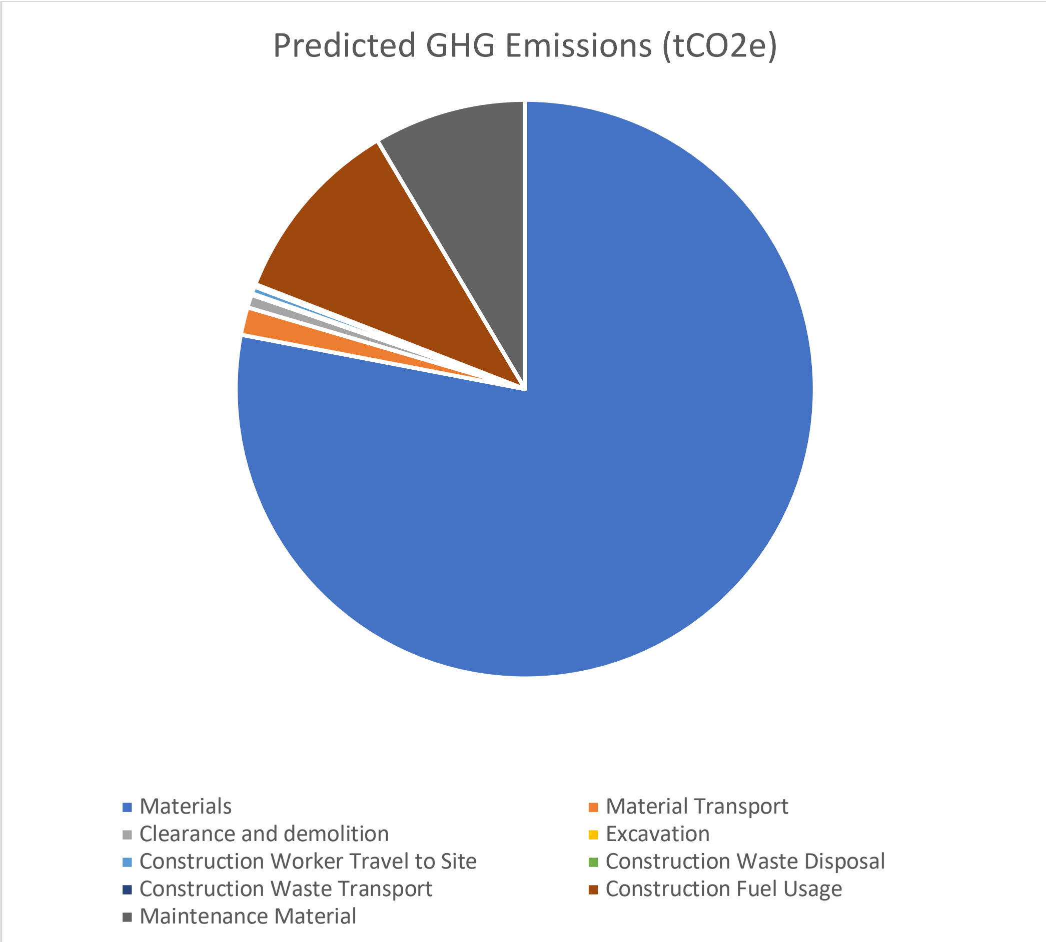

Figure 11.5- Construction Categories Greenhouse Gas Emissions tCO2e

The projected GHG emissions (outlined in Table 11-7) can be averaged across the entire lifespan of the Proposed Development to provide annual emissions estimates, facilitating direct comparison with national annual emissions and targets.

Table 11-8 compares these GHG emissions with the 2030 carbon budgets for the transport, industry, and waste sectors, Ireland's total GHG emissions for 2022, and Ireland's EU 2030 target of a 30% reduction in non-ETS sector emissions from 2005 levels (33 Mt CO2e) as specified in Regulation EU 2018/842.

When annualised over the Proposed Development's 50-year lifespan, the estimated total GHG emissions amount to 0.001% of Ireland's total GHG emissions in 2022 and 0.002% of Ireland's non-ETS 2030 emissions target. Specifically, emissions from transport-related activities account for 0.009% of the 2030 Transport budget, construction waste emissions represent 0.06% of the Waste budget, and industry-related emissions comprise 0.01% of the 2030 Industry budget.

Target/Sectoral Budget (tCO_2e)		**Sector Annualised Proposed Development GHG Emissions are Compared**	**Annualised Proposed Development GHG Emissions as % of Relevant Target/Budget**
Ireland's 2023 Total GHG Emissions (existing baseline)	58,829,000	Total GHG Emissions	0.001%
Non-ETS 2030 Target	33,381,312	Total GHG Emissions	0.002%

(Industry Sector) 2030 Sectoral Budget	4,000,000	Total Industry Emissions	0.01%
(Transport Sector) 2030 Sectoral Budget	6,000,000	Total Transport Emissions	0.009%
(Waste Sector) 2030 Sectoral Budget	1,000,000	Total Waste Emissions	0.06%

Table 11-8- Estimated Construction GHG Emissions relative to Sectoral Budgets and GHG Baseline

The proposed development incorporates a suite of measures designed to minimise greenhouse gas emissions during both the construction phase, as outlined within the Energy & Sustainability Report prepared by OCSC 2025. During construction, emissions will be reduced through a fabric-first approach that prioritises high-performance insulation, improved air-tightness, and low thermal transmittance, thereby lowering the long-term operational energy demand of the completed buildings. The specification of local materials, materials with recycled content, and the reuse of materials arising from demolition works where technically viable will further reduce embodied carbon. The Construction and Environmental Management Plan prepared by JJ Campbell 2025 further outlines mitigation measures that will be implemented to minimise or mitigate adverse construction effects on the environment during construction phase.

The current proposal seeks permission to relocate and reconstruct St. Teresa's Lodge in a new location (180 m south west within the development adjacent to Rockfield Park). A key focus of the project is the reuse of original materials—including roof timbers, decorative elements, and rubble stonework—with original brickwork cleaned and re-used wherever feasible. This approach not only preserves the historic character of the Lodge but also significantly reduces the development's embodied carbon by minimising the need for new materials and maximising the use of reclaimed components.

11.10.1.1 Impact of Climate Change on the Proposed Construction Phase

According to the 'LA 114 (2019) – Climate' guidance, which has been successfully implemented in the UK and referenced by the EPA here in Ireland, a qualitative assessment of disruption risk should be reported for the construction phase. The guidance suggests that changes to long-term seasonal averages due to climate change are not anticipated to be significant by the construction year, as predictions are typically cantered around mid-century. However, flooding during construction remains a possibility, and the areas at risk of flooding are detailed in Chapter 8 on Water (Including Hydrology & Flood Risk). Flood risk measures and extreme weather considerations have been integrated into the construction planning process.

A flood risk assessment was undertaken by JBA Consulting for the proposed development to assess the potential flood risk associated with the Carysfort-Maretimo Stream. A review of historical flood information confirmed that a flood event occurred on 24 October 2011 along Temple Road, adjacent to the site's north-eastern boundary. Based on the site's proximity to this flood location, minor inundation of the site was possible, although this would have been limited to the northern boundary. Based on the site topography, it is unlikely that the areas designated for proposed residential use were impacted.

Review of the CFRAM and DLR SFRA mapping indicates that the northern boundary of the site lies within Flood Zone A (defended)/B. However, the Proposed Development is not considered to be at significant flood risk. Existing flood defences along the Carysfort-Maretimo Stream provide protection up to the 1% AEP event, with the 0.1% AEP event limited to inundation of the access road only, without floodwater entering the site.

Residential units are located above predicted flood levels with adequate freeboard, and the basement and car park entrance are positioned within Flood Zone C with appropriate design levels.
Mitigation measures are outlined in Section 8.8.2 of Chapter 8 Hydrology to manage flood risk impacts during the construction stage, affecting the rail line, construction zones, and nearby

properties. With these measures implemented, the risk of climate change impacts, particularly flooding, during the construction phase of the proposed project is not deemed significant.

11.10.2 Operational Stage

11.10.2.1 Operational Traffic Impacts

There is the potential for increased traffic volumes to impact climate during the operational phase. The predicted concentrations of CO2 for the future years of 2028 and 2050 are detailed in Table 11-10 below.

These are significantly less than the 2030 set out under EU legislation (targets beyond 2030 are not available). It is predicted that in 2028 the Proposed Development will increase CO2 emissions by 0.001% of the EU 2030 target. Similarly low increases in CO2 emissions are predicted to occur in 2040 with emissions increasing by 0.0042% of the EU 2030 target.

Target/Sectoral Budget (tCO_2e)		Sector Annualised Proposed Development GHG Emissions are Compared	Annualised Proposed Development GHG Emissions as % of Relevant Target/Budget
Ireland's 2023 Total GHG Emissions (existing baseline)	58,829,000	Total GHG Emissions	0.0003%
Non-ETS 2030 Target	33,000,000	Total GHG Emissions	0.0006%
(Transport Sector) 2030 Sectoral Budget	6,000,000	Total Transport Emissions	0.0002%

Table 11-9- Estimated Operational GHG Traffic Emissions relative to Transport Budget and GHG Baseline

Year	Scenario	CO_2eq (tonnes/annum)
2028	Do Nothing	117.45
	Do Something	126.74
2043	Do Nothing	76.8
	Do Something	84.42
Increment in 2028		9.29
Increment in 2043		7.62

Table 11.10- Climate Traffic Assessment

11.10.2.2 Operational Impacts

Climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. As a result of this there is the potential for flooding related impacts on the site in future years. However, adequate attenuation and drainage have been provided for to account for increased rainfall in future years as part of the design of this development. Therefore, the impact will be long-term, localised, neutral and imperceptible.

There is the potential for a number of GHG emissions to the atmosphere during the operational phase of the development. The main sources of GHG emissions from the operational stage of the development arise from heating, domestic hot water, and lighting. The proposed project will introduce sustainable and renewable energy technology to the development. Ongoing maintenance of the Proposed Development materials has been accounted for within Section 11.10.1 above. The following section outlines the impact of operational energy use on GHG emissions.

There is also the potential for increased traffic volumes to impact climate. The change in AADT values is not of the magnitude to require a detailed climate assessment as per the DMRB screening criteria outlined in Section 11.6.3 (UK Highways Agency, 2019b). It can therefore be determined that traffic related CO_2 emissions during the operational phase are long-term, localised, neutral and imperceptible.

The Proposed Development has been designed to reduce the impact to climate where possible. A number of measures have been incorporated into the design to ensure the operational phase emissions are minimised. These are outlined fully within the Energy Statement prepared by OCSC and are summarised below.

The development will be a Nearly Zero Energy Building (NZEB) in accordance with the Part L2021 requirements. Each building will have a Building Energy Rating (BER) that will comply with the Part L requirements. The following measures, or similar will be incorporated into the Proposed Development to achieve a more energy efficient (i.e. less carbon intensive) design. All measures will be reviewed at the detailed design stage and the most appropriate options will be implemented.

- High performance U-values;
- Improved air tightness;
- Improved thermal transmittance and thermal bridging;
- Use of renewable technologies to ensure energy consumption is in line with the Part L 2021 requirements
- Both internal and external lighting to be energy efficient LED lighting.
- Water Heating plant is proposed to consist primarily of Exhaust Air Heat Pumps with back up heater.
- Building materials will be high-quality and long-lasting to reduce the requirement for regular maintenance or replacement which will reduce the embodied carbon footprint of the development.

It is proposed to incorporate bicycle and electric vehicle parking spaces within the Proposed Development to promote the use of sustainable transport. Overall, these measures will aid in reducing the impact to climate during the operational phase of the Proposed Development. Full descriptions of the measures proposed, and their benefits are outlined within the Building Lifecycle Report submitted with this application.

In Table 11-11, operational GHG emissions have been compared against the carbon budget for the residential sector in 2030, against Ireland's total GHG emissions in 2022 and against Ireland's EU 2030 target of a 30% reduction in non-ETS sector emissions based on 2005 levels (33 Mt CO_2e) (set out in Regulation EU 2018/842 of the European Parliament and of the Council).

The estimated total GHG emissions, when annualised over the 50-year Proposed Development lifespan, are equivalent to 0.0003% of Ireland's total GHG emissions in 2022 and 0.0006% of Ireland's non-ETS 2030 emissions target. The total GHG emissions associated with residential-related activities are 0.004% of the 2030 residential budget.

Target/Sectoral Budget (tCO_2e)		Sector Annualised Proposed Development GHG Emissions are Compared	Annualised Proposed Development GHG Emissions as % of Relevant Target/Budget
Ireland's 2023 Total GHG Emissions (existing baseline)	58,829,000	Total GHG Emissions	0.0003%
Non-ETS 2030 Target	33,000,000	Total GHG Emissions	0.0006%
(Residential Sector) 2030 Sectoral Budget	5,753,000	Total Industry Emissions	0.003%

Table 11.11- Estimated Operational GHG Emissions relative to Residential Budget and GHG Baseline

11.10.3 GHGA Significance of Effects

The TII guidance (2022) states that the following two factors should be considered when determining significance:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

The level of mitigation described in Section 11.11 has been taken into account when determining the significance of the Proposed Development's construction and operational GHG emissions. According to the ISEP significance criteria described in Section 11.6.3.4 and Table 11-2, the significance of the GHG emissions during the construction and operational phase is minor adverse.

In accordance with the EPA guidelines (EPA, 2022), the above significance equates to a significance of effect of GHG emissions during the construction and operational phase which is **direct, long-term, negative and slight, which is overall not significant.**

11.10.4 Climate Change Risk Assessment

11.10.4.1 Construction Stage

A detailed CCRA of the construction phase has been scoped out, as discussed in Section 11.6.4.5, which state that there are no residual medium or high-risk vulnerabilities to climate change hazards and therefore a detailed CCRA is not required. However, consideration has been given to the Proposed Development's vulnerability to the following climate change hazards with best practice mitigation measures proposed in Section 11.11:

- Flood risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding;
- Increased temperatures potentially causing drought, wildfires and prolonged periods of hot weather;
- Reduced temperatures resulting in ice or snow;
- Geotechnical impacts; and
- Major Storm Damage – including wind damage.

11.10.4.2 Operational Stage

To assess the vulnerability of the Proposed Development to climate change, it is essential to first evaluate the development's sensitivity and exposure to various climate hazards i.e. climate screening. The following climate hazards have been analysed in relation to the Proposed Development: flooding (coastal, pluvial, and fluvial), extreme heat, extreme cold, wildfire, drought, extreme wind, lightning, hail, landslides, and fog.

The sensitivity of the Proposed Development to these climate hazards is evaluated independently of its location. Table 11-12 provides a sensitivity assessment of the Proposed Development, rated on a scale from high (3) to medium (2) to low (1). After establishing sensitivity, the exposure of the Proposed Development to each climate hazard is determined, reflecting the likelihood of these hazards occurring at the project site, also rated on a scale of high (3), medium (2), and low (1). The overall vulnerability of the Proposed Development to each climate hazard is then calculated by multiplying sensitivity and exposure, as outlined in Table 11-12. This is the initial climate change screening prior to more detailed analysis utilising Climatics climate modelling.

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flooding (Coastal, Pluvial, Fluvial)	1 (Low)	2 (Medium)	2 (Low)
Extreme Heat	1 (Low)	1 (Low)	1 (Low)
Extreme Cold	1 (Low)	1 (Low)	1 (Low)
Wildfire	1 (Low)	1 (Low)	1 (Low)
Drought	1 (Low)	1 (Low)	1 (Low)
Extreme Wind	1 (Low)	1 (Low)	1 (Low)
Lightning & Hail	1 (Low)	1 (Low)	1 (Low)
Landslides	1 (Low)	1 (Low)	1 (Low)
Fog	1 (Low)	1 (Low)	1 (Low)

Table 11.12- Climate Change Vulnerability Assessment/Screening

The sensitivity and exposure of the area were assessed using various online tools such as Met Éireann's TRANSLATE tools, Climate Ireland – Climate Change Projection Maps, and DNV's Climatics multi-climate hazard analysis tool in addition to the project teams subject matter expertise. The analysis concluded that the Proposed Development has no significant vulnerabilities to the identified climate hazards, as outlined below. All identified vulnerabilities are classified as low. As a result, there are no residual medium or high-risk vulnerabilities related to climate change hazards, making a detailed Climate Change Risk Assessment (CCRA) unnecessary.

The Site-Specific Flood Risk Assessment (SSFRA) conducted by JBA,2025 indicates that the site is located within Flood Zone A/B. The primary flood risk for the Proposed Development is fluvial flooding, due to its close proximity to the Carysfort- Maretimo Stream which is located 20m to the west of the site's boundary. Other watercourses in the are the Priory Stream which is located 650m northwest and the Sradbrook Stream which is located 850m to the southeast of the site.

Groundwater flooding occurs when the water table rises above the land surface, this means the natural underground drainage system is incapable of sufficiently draining itself, resulting in the emergence of groundwater at the surface. It generally requires sustained rainfall over relatively longer duration than other forms of flooding, its location is discontinuous, and they can last for weeks or months. There have been no historic or predictive groundwater flooding events on site or nearby. In addition, there are no karst features in the immediate vicinity of the site. The SSFRA has determined that the Proposed Development is not at risk of groundwater flooding.

The site is located in close proximity to the coastline, with Dublin Bay located c. 350m northeast of the site boundary. The main watercourse is identified as the Carysfort-Maretimo Stream which is located c. 20m from the site's western boundary. The Carysfort-Maretimo Stream runs predominantly in a north-easterly direction in the area and discharges to Dublin Bay c. 400m north of the site. Flood defences are in place along the Carysfort-Maretimo in the vicinity of the development. The stream is culverted under the Temple Road at the site's north-western boundary. Other watercourses in the area have been identified as the Priory Stream which is located c. 650m northwest and the Sradbrook Stream which is located c. 850m to the southeast.

The SSFRA also reviewed a number of sources of flood information to establish any recorded flood history at the proposed development. In October 2011, a significant flood event occurred following heavy rainfall in Dublin, estimated between a 1% and 2% Annual Exceedance Probability (AEP). The Carysfort/Maretimo stream overflowed, extensively flooding the Stillorgan/Blackrock area. The event resulted in up to two feet of floodwaters along a two-kilometre stretch, impacting several estates and rendering Carysfort Avenue near impassable. The flood event occurred at the site's north-eastern boundary. The FRA concluded based on the proximity of the site to this flood point, inundation of a section of the site was likely but restricted to the most northern boundary. Based on the site topography it is unlikely that any areas containing the proposed residential uses were affected.

Due to the predicted increase in the frequency and intensity of extreme rainfall events, it is prudent that site specific drainage and management measures aimed at mitigating the effects of pluvial flooding are incorporated into the development design. The Proposed Development includes the construction of a surface water network which consists of Sustainable Urban Drainage Systems (SuDS) measures which will minimise the impact to the receiving environment and manage the pluvial flood risk at the site. Refer to the wider application for the stormwater design details. In the absence of a specific climate change flood extent the 0.1 % AEP flood event has been substituted to represent the 1% AEP climate change flood extent. In this context the proposed modifications have been confirmed to be not impacted by climate change.

The correct operation and maintenance of the drainage system is necessary to reduce the risk of human or mechanical error causing pluvial flood risk from blockage.

Flood defences are in place along the Carysfort-Maretimo in the vicinity of the proposed development and the stream is culverted under the Temple Road to the north-west of the site's boundary. The Carysfort-Maretimo flood defences provide protection up to the 1% AEP flood event including an allowance for climate change. The site is not at risk to coastal flood events. A stormwater system will be incorporated within the development design to manage surface water run-off from the site. Stormwater attenuation tanks are included as part of the design to ensure that stormwater discharge is limited to its greenfield equivalent. Additional SuDs measures have incorporated into the design. This includes the implementation of green and blue roofs to the apartment blocks covering a minimum of 60% of the roof area. Permeable paving has also been provided which has been designed to intercept the first 5mm of runoff.

The Dún Laoghaire-Rathdown County Development Plan 2022-2028 SFRA shows the site is partially within Flood Zone A/B and the mapping is based on the Irish Coastal Protection Strategy Study (ICPSS) dataset, however this dataset is now superseded by ICWWS. It should be noted that the SFRA flood maps are also based on the Eastern CFRAM flood outlines, which places the western boundary of the site within Flood Zone A/B and therefore, at a moderate risk of flooding. The flood defences along the Carysfort-Maretimo are referred to within the SFRA, as follows "These defences are of robust construction, although consideration of the impacts of overtopping, either through higher return period events or with the impact of climate change on river flows, should be taken into account in any site specific flood risk assessment. Breach assessment is unlikely to be required".

Regarding wildfires, the Think Hazard! tool developed by the Global Facility for Disaster Reduction and Recovery classifies the wildfire hazard in the area as low. This classification suggests there is a 4% to 10% chance of weather conditions that could support a problematic wildfire in the project area, potentially causing disruptions and posing a low but real risk to life and property each year. Although future climate models predict an increase in conditions favourable to wildfires—such as higher temperatures and extended dry periods—the project's suburban location significantly reduces the wildfire risk. Therefore, the Proposed Development is considered to have a low vulnerability to wildfires.

According to the Landslide Susceptibility Map developed by Geological Survey Ireland (GSI), the Proposed Development Site ranges from Low to Moderately Low in terms of landslide susceptibility.

Extreme temperatures, whether extreme heat or cold, have the potential to affect building materials and associated infrastructure. During the detailed design stage, high-quality, durable, and resilient materials will be selected to withstand future temperature fluctuations due to climate change. Consequently, the Proposed Development is assessed to have, at most, low vulnerabilities to these climate hazards, and a detailed risk assessment is not necessary.

There is no additional vulnerability with respect to all climate hazards when design mitigation has been put in place in order to alleviate this known vulnerability to future climate change risk.

11.10.4.3 CCRA Significance of Effects

With the implementation of design mitigation measures, the Proposed Development faces no substantial risks from climate change. As outlined in the EPA Guidelines (EPA, 2022), the impacts of climate change on the development are considered **direct, long-term, negative**, and **imperceptible**, and are therefore **not deemed significant** in terms of Environmental Impact Assessment (EIA).

11.10.5 Potential Cumulative Impacts

Regarding the requirement for a cumulative assessment, TII PE-ENV-01104 (2022) indicates that "since the GHG assessment pertains to global climate and the impacts on the receptor from a project are not geographically constrained, the typical approach for cumulative assessment in EIA is not deemed applicable." However, by evaluating the GHG impact of a project in relation to its alignment with Ireland's trajectory towards net zero and sectoral carbon budgets, this assessment will demonstrate the project's potential influence on Ireland's ability to meet its national carbon reduction targets. Consequently, the assessment approach is inherently cumulative.

In accordance with IEMA guidance, all GHG emissions are considered cumulatively significant as they contribute to global climate change. The assessment therefore quantifies the project's emissions, places them in the context of relevant carbon budgets, and identifies mitigation measures. For climate change risk assessment, the approach differs: it is a risk-based process focused on the project's resilience to future climate conditions rather than additive impacts. Cumulative assessment in the traditional sense is not generally applicable because climate risks are external drivers, not project-generated effects. However, potential cumulative effects related to climate have been considered within this EIA Chapter.

Cumulative impacts result from the combined effects of the Proposed Development alongside other existing or planned developments in the area. These impacts can intensify climate-related risks and environmental pressures, leading to more pronounced and widespread consequences. ISEP emphasises the importance of understanding these interactions to develop effective mitigation and adaptation strategies that align with broader sustainability objectives.

The cumulative assessment presented in this chapter is informed by the list of existing, permitted, and proposed developments outlined in Chapter 2 of this EIAR, which should be referred to for full details.

Greenhouse Gas (GHG) Emissions

As per ISEP's guidance on assessing climate change within EIAs (2022), the cumulative effect of GHG emissions from the Proposed Development, in conjunction with other developments, must be carefully evaluated. The aggregation of emissions across multiple projects can significantly contribute to global climate change, exacerbating the effects of rising temperatures, more frequent extreme weather events, and changes in precipitation patterns. To address this, we have identified robust mitigation measures aimed at reducing the development's carbon footprint, ensuring alignment with regional and national climate targets, and adhering to the principles of the EU Taxonomy and Near Zero Energy Building (NZEB) standards. Nearby emission sources to the proposed development include the Dublin Bay Powerplant and local traffic emissions.

Water Resources and Flooding

ISEP (2022) stresses the importance of considering cumulative impacts on water resources, particularly with respect to flood risks and water availability. The combined effect of increased rainfall due to climate change and additional impermeable surfaces from multiple developments can overwhelm existing drainage infrastructure, leading to a higher frequency and severity of flooding events. This underscores the need for integrated water management strategies that enhance the resilience of water systems and incorporate climate adaptation measures, such as sustainable urban drainage systems (SUDS), as recommended within the site-specific flood risk assessment.

Biodiversity and Habitat Loss

Cumulative impacts on biodiversity are another significant concern. ISEP guidance (2022) highlights that climate change, coupled with habitat loss from multiple developments, can lead to more severe impacts on ecosystems and species. The fragmentation of habitats and disruption of ecological networks can accelerate species decline and reduce ecosystem resilience. To mitigate these impacts, the EIA should incorporate strategies for habitat conservation, restoration, and connectivity, ensuring that biodiversity is protected and enhanced in the face of cumulative pressures.

Air Quality and Human Health

ISEP also advises considering the cumulative impacts on air quality and human health. Increased emissions from multiple developments can lead to higher concentrations of pollutants, exacerbating climate change-related health risks, such as respiratory conditions and heat-related illnesses. The EIA should ensure that air quality management plans are in place and that mitigation measures are designed to minimise emissions, particularly in urban areas where cumulative impacts are more likely to be significant.

Soil Degradation and Erosion

Cumulative impacts on soil degradation and erosion are another area of concern highlighted by ISEP. The combined effects of climate change-induced extreme weather events and land disturbance from construction activities can lead to accelerated soil erosion, reduced fertility, and increased sedimentation in water bodies. Sustainable land management practices, including erosion control measures and soil conservation techniques, should be integrated into the development to mitigate these cumulative impacts.

Infrastructure and Energy Demand

Finally, ISEP's guidance emphasises the importance of considering the cumulative impacts on infrastructure and energy demand. As multiple developments increase the demand for energy, there is a risk of overloading local grids and increasing reliance on fossil fuels, which could exacerbate GHG emissions and climate change. The Proposed Development does promote energy efficiency, the use of renewable energy sources, and the integration of smart grid technologies to ensure that infrastructure can accommodate future energy needs without compromising climate goals.

11.10.6 Mitigation and Monitoring

In accordance with ISEP guidance (2022), addressing cumulative impacts requires a comprehensive approach that includes effective mitigation strategies and ongoing monitoring. These strategies should focus on enhancing energy efficiency, reducing GHG emissions, protecting natural habitats, managing water resources sustainably, and ensuring resilient infrastructure. Continuous monitoring and adaptive management will be essential to identify cumulative impacts early and to adjust mitigation measures as necessary to minimise long-term environmental and climate-related risks.

By considering cumulative impacts within the climate chapter of the EIA, we ensure a thorough and responsible assessment that aligns with ISEP's best practices, contributing to the sustainability and resilience of both the Proposed Development and the broader environment.

11.10.7 Do Nothing Scenario

Under the Do-Nothing Scenario no construction works will take place and the previously identified impacts of carbon emissions from equipment, machinery and development operation will not occur. Therefore, this scenario can be considered neutral in terms of climate.

11.11 Avoidance, Remidial & Mitigation Measures

11.11.1 Construction Stage

During the construction stage specific climate resilience measures should focus on ensuring durability, water management, and energy efficiency while mitigating risks associated with extreme weather. Regarding the development's resilience to climate change, the Contractor will be required to mitigate the effects of extreme weather, such as heavy rainfall, flooding, windstorms, and temperature fluctuations, through site risk assessments and method statements. Here are key Avoidance, Remedial & Mitigation Measures:

Foundation & Site Preparation

- Flood Resilient Foundations: Use raised foundations, elevated platforms, or piling where necessary in flood-prone areas.
- Sustainable Drainage Installation: Implement permeable surfaces, drainage channels, and attenuation tanks early in construction.
- Soil Stabilisation: Prevent erosion with silt fences, geotextiles, and retaining structures to withstand heavy rainfall.
- **Structural Reinforcement**
- Wind-Resistant Framing: Use reinforced concrete or steel frames with proper anchoring to withstand storms.
- Secure Roof Fixings: Ensure hurricane straps, reinforced trusses, and mechanically fixed roof tiles to prevent wind damage.
- Impact-Resistant Windows & Doors: Install reinforced glass or shutters to reduce storm-related damage.

Water & Moisture Management

- Damp-Proofing Measures: Use high-quality damp-proof membranes (DPM) and damp-proof courses (DPC) in walls and floors.
- Proper Drainage on Site: Ensure temporary drainage solutions (e.g., trenches, sumps) to manage rainwater during construction.
- Weatherproofing Structures: Apply breathable but water-resistant membranes on external walls before cladding installation.

Material Selection & Handling

- Use Climate-Resilient Materials: Opt for treated timber, marine-grade plywood, concrete with low permeability, and corrosion-resistant steel.
- Storage & Protection of Materials: Keep materials covered and off the ground to prevent water damage or degradation.

- Low-Carbon Concrete & Insulation: Use alternatives like GGBS (Ground Granulated Blast-furnace Slag) concrete and eco-friendly insulation.

Energy Efficiency & Passive Design Implementation

- High-Performance Insulation Installation: Ensure proper fitting to avoid thermal bridging and moisture ingress.
- Airtightness Testing During Construction: Conduct interim blower door tests before final finishes to confirm air sealing effectiveness.
- Green Roof Base Layers: Install waterproofing and root barriers early if a green roof is part of the design.

On-Site Climate Adaptation Measures

- Construction Scheduling Considerations: Plan for extreme weather events, avoiding major excavation or external works in heavy rain seasons.
- Cold/Hot Weather Plan: Strategies such as planned road gritting, thermal protection, chemical accelerants, temporary enclosures, and alternative heating/cooling solutions enable builders to overcome these obstacles and achieve successful project outcomes.
- Temporary Wind & Rain Barriers: Use tarpaulins, scaffolding covers, and temporary roofing to protect partially built structures.
- Emergency Power Supply: Have generators or battery backups on site to maintain critical construction processes.

11.11.1.1 Climate Resilience Avoidance, Remedial & Mitigation Measures

Embodied carbon of materials and construction activities is the primary source of climate impacts during the construction phase. Where possible, the proposed St. Teresa's residential development will specify the use of local materials containing recycled content and will reintegrate materials arising from demolition works as long as is technically viable. A Demolition Plan – D1 drawing which accompanies this planning application details structures that have been demolished as part of 2019 granted permissions SHD ABP-303804-19. Further pre-construction carbon Avoidance, Remedial & Mitigation Measures include:

Design for Performance

- Request a Design for Performance approach from design teams and contractors.
- Include contractual targets for whole life carbon with a focus on Net Zero and nature-positive goals where possible.

Circularity in Design

- Require design teams to develop a circularity concept for projects, focusing on adaptability, disassembly, and reuse.
- Set a target for a percentage of reused and recycled materials in designs.

Building Lifecycle Report

- Ensure the building lifecycle report is regularly reviewed and updated in line with current policy and best practice for sustainable construction.

Carbon Literacy

- Develop carbon literacy within design and construction teams by providing training on carbon literacy, ESG reporting, and disclosure.
- Incorporate sustainability and carbon considerations into site team talks, construction targets, and reporting.
- Include training clauses for contractors and sub-contractors to upskill their teams in low-energy construction techniques.

Building Renovation Passports (BRPs)

- Request Building Renovation Passports for this asset as part of the roadmap to decarbonise each asset.

Cement Reduction

- Specify the minimum amount of cement needed in concrete and substitute where feasible to reduce cement usage.

Sustainable Procurement

- Review sustainable procurement and material choices during detailed design to identify and implement lower embodied carbon options.
- Request Environmental Product Declarations (EPDs) and prefer products with EPDs where possible within procurement restrictions.
- Drive demand for EPDs by increasing the percentage of products used in the project with EPDs.

European Framework for Sustainable Buildings

- Commit to using key indicators from the European Framework for sustainable buildings, Level(s), with support from the IGBC.
- Focus on indicators such as Life Cycle Assessment (LCA), Life Cycle Cost (LCC), Indoor Air Quality (IAQ), and Circularity.

Energy and Carbon Performance Reporting

- Plan to disclose the operational energy and carbon performance of the project in your annual reporting.

Post-Occupancy Evaluation

- Allow for post-occupancy evaluation of completed developments to ensure feedback is passed to the design team.

Demolition and Construction Waste Management

- Create a demolition and construction programme allowing sufficient time to determine reuse and recycling opportunities for demolition waste.
- Appoint a competent demolition contractor to undertake a pre-demolition audit detailing resource recovery best practice and identifying materials for reuse and recycling.
- Reuse materials on site in the new build areas where possible.

EU Taxonomy Compliance

- Commit to complying with EU taxonomy requirements on the circular economy, specifically reuse, recycling, and material recovery of demolition and construction waste.
- Review and ensure compliance with the EU Taxonomy Regulation (EU) 2020/852 regarding circular economy practices for demolition and construction waste.

Local Material Sourcing

- Source materials locally where possible to reduce transport-related CO_2 emissions.

Specific measures will be introduced during the construction phase to further reduce GHG (GHG) emissions:

- Materials like mixed construction and demolition waste, plastic, concrete, brick, tiles, ceramics, and bituminous mixtures will be diverted from waste processing and reused on-site, where possible.

- Timber will be used as a lower-carbon alternative for framing house units.

Additionally, certified datasheets for construction materials will outline their operational temperature limits, ensuring that temperature-sensitive materials perform adequately. The Contractor will also address risks associated with fog, lightning, and hail through appropriate risk assessments and mitigation plans.

During the construction phase the following best practice measures shall be implemented on site to prevent significant GHG emissions and reduce impacts to climate:

- **Energy-Efficient Equipment:** Use energy-efficient machinery and equipment on-site. Regular maintenance and proper operation can also help reduce fuel consumption and emissions.
- **Renewable Energy:** Incorporate renewable energy sources, such as solar panels, to power construction activities. This can significantly reduce reliance on fossil fuels
- **Reduce Idling**: Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
- **Sustainability Awareness**: Ensure that sustainability and carbon specifically is incorporated into site team talks, construction and reporting targets. Integrate training clauses for contractors and sub-contractors to upskill their onsite personnel including sub-contractors in low energy construction skills. Appoint sustainability champions to ensure that the project continues to perform in a sustainable manner.
- **Sustainable Transportation**: Encourage carpooling, use of public transportation, or electric vehicles for workers commuting to the site.
- **Monitoring and Reporting:** Regularly monitor and report GHG emissions from the construction site. This helps in identifying areas for improvement and ensuring compliance with environmental standards Sustainability spot checks should be added to ongoing site inspections and feedback shared with all onsite to ensure measures are being adopted.
- **Maintenance**: Ensure all plant and machinery are well maintained and inspected regularly.
- **Waste Management:** Implement a robust waste management plan to reduce, reuse, and recycle construction waste. Proper waste management can significantly cut down on emissions Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site. Application of the waste hierarchy to all waste material generated.
- **Sustainable Procurement:** Sourcing low carbon materials locally where possible to reduce transport related CO_2 emissions.

11.11.2 Operational Stage

Several measures have been incorporated into the design of the development in order to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the Proposed Development to climate change (see Section 11.7.3).
The Proposed Development has been designed to reduce the impact on climate as a result of energy usage during operation. The Sustainability and Energy Statement prepared by OCSC and building lifecycle report prepared by Aramark and submitted under separate cover with this planning application details a number of incorporated design mitigation measures that have been incorporated into the design of the development to reduce the impact on climate wherever possible.

Such measures included in the Proposed Development to reduce the impact to climate from energy usage are:

- The development will be in compliance with the requirements of the Near Zero Energy Building (NZEB) Standards.
- EU Taxonomy alignment with 10% lower than NZEB.
- A renewable energy rating (RER) of 20% will be achieved to comply with Part L (2021) of the NZEB regulations.
- A Building Energy Rating (BER) of A2/A3 is being targeted.
- Improved building thermal transmittance (U-Values), air permeability and thermal bridging.
- Use of air source heat pumps.
- Sustainability information provided to building occupants
- Smart building technologies
- Approach is based on the Energy Hierarchy Plan - Be Mean, Be Lean, Be Green

In addition, electric vehicle and bicycle parking will be provided within the development which will promote the use of more sustainable modes of transport and reduce potential transport emissions. Full descriptions of the measures proposed, and their benefits are outlined within the Building Lifecycle Report submitted with this application.

11.12 Residual Impacts

The Proposed Development will result in some impacts to climate through the release of GHGs. ISEP (2022) state that the crux of assessing significance is "not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050". The Proposed Development has proposed some best practice mitigation measures and is committing to reducing climate impacts where feasible, the development will comply with the do-minimum standards set through regulation (NZEB and Part L 2021). As per the assessment criteria in section 11.6.4.4 the impact of the Proposed Development in relation to GHG emissions is considered **long-term, minor adverse and not significant.**

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the Proposed Development as a result of climate change.

11.13 Risk of Major Accidents or Disasters

As detailed in Section 11.10.2, climate change could shift weather patterns and lead to more frequent rainfall in the coming years. Nonetheless, a thorough review of the potential flood risk at the site has been conducted, and sufficient measures for attenuation and drainage have been incorporated to address increased rainfall. The Proposed Development has been evaluated as having a low susceptibility to climate change-related hazards, with no major risks identified. Consequently, the impact is considered direct, long-term, negative, and imperceptible, and is therefore not deemed significant in terms of the Environmental Impact Assessment (EIA).

11.14 Worst Case Scenario

Worst case estimates have been used as part of this assessment. As a result, Section 11.11 details the worst-case impact for the Proposed Development.

11.15 Monitoring

11.15.1 Construction Stage

We recommend the following monitoring strategies to ensure compliance with the environmental objectives outlined in this EIA. These strategies are essential for effectively managing the environmental impacts associated with the demolition and construction phases, with a particular focus on resource recovery, waste management, and the reduction of GHG emissions.

Monitoring of Demolition Waste Reuse and Recycling

To optimise the reuse and recycling of demolition materials, we recommend implementing the following:

- Material Reuse Tracking System: A digital tracking system could be established to monitor materials identified for reuse or recycling. This system will log details such as quantities, conditions, and intended applications within the new construction areas. It is important that this system is regularly updated to reflect ongoing recovery efforts.
- Weekly Progress Reports: It is suggested that the demolition contractor be required to submit weekly progress reports. These reports should provide detailed metrics on the volumes of materials recovered, reused, and recycled, alongside any challenges encountered. This approach will allow for the early identification of issues and timely adjustments to the recovery plan.
- Regular On-Site Inspections: It is suggested that regular inspections are conducted to verify that materials earmarked for reuse are being properly stored and handled. These inspections should ensure that materials remain in suitable condition for their intended use in the new build areas.

Competency and Performance of Demolition Contractor

To ensure that the demolition process aligns with the project's environmental goals, we propose the following monitoring measures:

- Verification of Pre-Demolition Audit: The pre-demolition audit conducted by the appointed contractor should be thoroughly reviewed to confirm that all materials and components suitable for reuse or recycling have been accurately identified. This review will ensure that the audit reflects best practice in resource recovery.
- Periodic Contractor Performance Reviews: We suggest conducting periodic performance reviews of the demolition contractor. These reviews should focus on their adherence to the resource recovery plan, the accuracy of material identification, and their overall compliance with project timelines without compromising environmental standards.

Compliance with EU Taxonomy for Circular Economy

Given the project's commitment to meeting EU taxonomy requirements, we recommend the following:

- Comprehensive Documentation and Reporting: It is essential to maintain detailed records that document compliance with the circular economy principles outlined in the EU taxonomy. This documentation should include logs of all recycled materials, percentages of materials reused on-site, and detailed descriptions of how circular economy practices are being implemented.
- Independent Third-Party Audits: It is suggested that an independent auditor is engaged to periodically assess the project's compliance with the EU taxonomy. The audit should verify the accuracy of reported data and ensure that the circular economy requirements are fully adhered to throughout the project.

Monitoring of GHG Emissions Reduction Measures

To mitigate the project's impact on climate change, the following monitoring activities are proposed:

- Appoint sustainability champions to ensure that the project continues to perform in a sustainable manner including monitoring and reporting of performance on site.
- Idle Time Monitoring for Vehicles and Machinery: It is suggested that GPS or telematics systems are installed on all vehicles and machinery used on-site to monitor engine idling times. Automatic alerts should be set up to notify site managers when idling exceeds a specified threshold, enabling prompt corrective action to reduce unnecessary emissions.
- Maintenance Logs for Plant and Machinery: Implementing a digital maintenance log system to track the inspection and maintenance of all on-site equipment is recommended. This system should record inspection dates, maintenance activities, and any identified issues, ensuring that all machinery operates efficiently and with minimal emissions.
- Material Waste Minimisation Tracking: A monitoring system should be developed to track material orders and usage. This system should identify trends in over-ordering or inefficient material use, enabling the project team to take corrective actions that will help minimise the embodied carbon footprint of the site.

Application of Waste Hierarchy

To optimise waste management on-site, the following monitoring protocols are suggested:

- Waste Segregation Audits: Regular audits should be conducted to ensure that waste is being properly segregated according to the waste hierarchy (reduce, reuse, recycle). These audits will help identify opportunities for improving waste management practices and reducing overall waste generation.
- Monthly Waste Management Reports: It is suggested that monthly reports are generated detailing the volume of waste reduced, reused, and recycled. These reports should be compared against predefined targets to assess the effectiveness of the waste management strategies and to identify areas for improvement.

Local Sourcing of Materials

To reduce transport-related emissions and support local suppliers, the following measures are suggested:

- Supplier Distance Monitoring: A database of suppliers should be developed, documenting the distance of each supplier from the construction site. This database should be used to monitor and minimise the carbon footprint associated with material transportation, prioritising local suppliers wherever possible.
- Transport-Related Carbon Footprint Analysis: Conducting a carbon footprint analysis for the transportation of all materials to the site is recommended. This analysis should inform the selection of suppliers, with a preference for those within a closer radius to reduce CO_2 emissions.

These monitoring recommendations are designed to ensure that the project adheres to its environmental commitments, particularly in the areas of resource recovery, waste management, and greenhouse gas emissions reduction. By implementing these strategies, the project will not only comply with regulatory requirements but also contribute to broader environmental sustainability goals. Regular reporting, on-site inspections, and third-party audits will be critical to maintaining compliance and achieving the desired environmental outcomes.

11.15.2 Operational Stage

Environmental Management Plan that incorporates adaptive management principles.
Ensure climate change resilience plans are robust; continued monitoring of trends in weather events; and continued review of resilience measures related to interdependencies.

We recommend the following monitoring strategies to ensure that the Proposed Development meets its environmental objectives. These strategies focus on mitigating the impacts of climate change, enhancing energy efficiency, and promoting sustainable transport, all of which are aligned with best practices outlined in ISEP guidelines.

Monitoring of Climate Change Mitigation Measures

- **Attenuation and Drainage Systems Monitoring**: Consistent with ISEP's guidance on climate resilience, regular inspections should be undertaken to verify the functionality of the attenuation and drainage systems. These inspections should be conducted during construction, after significant rainfall events, and periodically thereafter to ensure long-term effectiveness in preventing flooding.
- **Climate Vulnerability Assessment Review**: In accordance with ISEP's recommendation to periodically reassess climate risks, we suggest reviewing the climate vulnerability assessment (as detailed in Section 11.7.3) at regular intervals. This review should incorporate the latest climate projections to ensure the mitigation measures remain adequate and effective.

Monitoring of Energy Efficiency and Climate Impact Reduction

To minimise the impact of the development on climate through energy use during operation, the following monitoring activities are recommended:

- **NZEB Compliance Verification**: Continuous monitoring during the construction phase should ensure that the development complies with the Near Zero Energy Building (NZEB) Standards. This includes verifying that all building components and systems meet the NZEB criteria.
- **EU Taxonomy Alignment Monitoring**: Ensure that the development achieves energy performance that is at least 10% lower than the NZEB requirements. Regular energy performance assessments should be conducted to confirm alignment with the EU Taxonomy for sustainable development.
- **Renewable Energy Ratio (RER) Compliance**: Monitor the implementation of renewable energy systems, such as solar panels and air source heat pumps, to ensure that the development achieves a Renewable Energy Ratio (RER) of 20%, in line with Part L (2021) of the NZEB regulations. Post-installation, periodic checks should be performed to verify ongoing compliance.
- **Building Energy Rating (BER) Target Achievement**: Regular energy audits should be carried out to monitor the building's energy performance, ensuring that the targeted Building Energy Rating (BER) of A2/A3 is achieved. This includes verifying the efficiency of insulation, windows, HVAC systems, and other energy-related components.
- **Thermal Performance Monitoring**: Continuous monitoring during construction should ensure that the building achieves the improved thermal transmittance (U-Values), air permeability, and thermal bridging standards specified in the design. Post-construction thermal imaging surveys and air tightness tests should be conducted to confirm that these standards have been met.

Monitoring of Renewable Energy Systems

To ensure the successful implementation and operation of renewable energy systems, the following monitoring measures are recommended:

- **Air Source Heat Pump Performance**: Regular inspections and maintenance checks should be conducted on the air source heat pumps to ensure they are operating efficiently and contributing effectively to the building's energy needs. Performance metrics such as Coefficient of Performance (COP) and Seasonal Performance Factor (SPF) should be tracked and compared against the expected values.
- **Occupant Sustainability Information**: Consistent with ISEP's emphasis on stakeholder engagement, it is important to ensure that all building occupants receive comprehensive sustainability information. This should include guidance on energy conservation practices and how to use renewable energy systems effectively. Feedback mechanisms, such as surveys, should be used to assess the impact of this information on occupant behaviour.

Monitoring of Sustainable Transport Initiatives

To promote sustainable transport and reduce transport-related emissions, the following monitoring strategies are suggested:

- **Electric Vehicle (EV) and Bicycle Parking Usage**: Regular monitoring should be carried out to assess the usage of electric vehicle charging stations and bicycle parking facilities within the development. This will help gauge the effectiveness of these measures in promoting sustainable transport modes. Usage data can inform whether additional facilities or adjustments are needed.
- **Transport Emissions Impact Assessment**: Periodic assessments should be conducted to evaluate the impact of the provided sustainable transport facilities on reducing overall transport emissions. This could include monitoring the uptake of electric vehicles by residents and the corresponding reduction in GHG emissions.

These monitoring recommendations are designed to ensure that the development's climate change mitigation measures, energy efficiency initiatives, and sustainable transport provisions are effectively implemented and maintained throughout the lifecycle of the project. By adhering to these strategies, the development will not only comply with relevant regulatory requirements but also contribute to broader environmental sustainability goals. Regular inspections, energy performance assessments, and occupant engagement will be crucial to achieving the desired environmental outcomes.

11.16 Interactions

Climate interactions with various environmental topics are extensive and significant, highlighting the broad effect of climate factors across different aspects of the environment. The "avoidance, remediation and mitigation" section of this chapter outlines effective management and reduction measures for the following identified interactions.

One of the most critical interactions is between climate and GHG emissions The Proposed Development's carbon footprint, including emissions from construction and operational activities, energy use, and transportation, plays a role in influencing climate change. Effective management and reduction measures for these emissions are outlined in the mitigation section to support climate resilience and regulatory compliance.

Population and Human Health

Human health and well-being are closely linked to climate factors. Climate change can exacerbate health issues such as heat stress, respiratory conditions, and vector-borne diseases. While the

Population and Human Health chapter focuses on direct health determinants, the Climate Chapter also considers indirect pathways through which climate-related measures may influence public health. These include:

- Air quality impacts from construction and operational traffic, which are addressed in parallel with climate assessment;
- Noise and vibration disturbance, particularly in relation to sensitive receptors such as residential dwellings;
- Green infrastructure and landscaping, which contribute to urban cooling, improved air quality, and enhanced amenity;
- SuDS and water management systems, which reduce flood risk and associated health hazards.

These measures support climate resilience and help safeguard public health in the context of a changing climate.

Biodiversity

Climate change can alter habitat conditions, encourage spread of invasive species, disrupt species distributions, and affect ecological balances. These shifts may impact local flora and fauna, particularly in sensitive coastal and estuarine environments adjacent to the Proposed Development.

The Biodiversity chapter outlines a suite of mitigation and enhancement measures that directly support climate resilience, including:

- Planting of native tree and hedgerow species selected for their adaptability to changing climatic conditions;
- Integration of green infrastructure such as permeable paving, green walls, and pollinator-friendly planting to support ecosystem services;
- Sustainable drainage systems (SuDS) to manage water quality and quantity; and
- Lighting design to reduce disturbance to nocturnal species.
- Long-term habitat management, including for the prevention of the introduction and spread of invasive species.
- Biodiversity measures listed above and included within the biodiversity chapter align with national and EU climate adaptation strategies, contributing to broader goals such as carbon neutrality, nature-based solutions, and ecosystem-based adaptation. Such strategies include:
- CAP25 explicitly supports a transition to a biodiversity-rich, climate-resilient, and environmentally sustainable economy
- National Adaptation Framework (NAF) 2025, which identifies biodiversity as a priority sector for climate adaptation, promotes ecosystem-based adaptation and nature-based solutions to address climate risks such as flooding, drought, and habitat loss, and encourages local and sectoral adaptation plans to integrate biodiversity and climate resilience.
- EU Adaptation Strategy (2021 Update) which emphasizes nature-based solutions (NbS) as a key cross-cutting priority. Supports ecosystem restoration, urban greening, and coastal protection as climate adaptation tools, and promotes integration of NbS into urban planning, water management, and disaster risk reduction.
- EU Biodiversity Strategy 2030 which aims to restore at least 30% of degraded ecosystems by 2030. Recognizes biodiversity as essential for climate mitigation and

adaptation, and supports green infrastructure and ecological connectivity to enhance resilience.

These measures contribute to carbon sequestration, urban cooling, and ecological connectivity, enhancing the site's resilience to climate change and supporting long-term biodiversity conservation.

Land and Soils

Climate change can affect soil moisture, erosion rates, and land productivity. Increased rainfall may lead to soil erosion, while extended dry periods can degrade soil quality. The Proposed Development includes mitigation measures to manage these risks.

Ground investigations were undertaken in December 2018 and November 2020 by Ground Investigations Ireland. Confirmatory environmental soil testing will be undertaken after the demolition phase and prior to any material being removed from site, in order to verify the assessment made on the basis of the ground investigations. Due to the nature of the usage of this site as an educational facility, it is not envisaged that contaminated soil will be encountered.

The project engineers J.J. Campell and Associates have estimated that c. 12,000 m^3 of material will be excavated to facilitate construction. Of this, 10,800 m^3 is expected to be reused onsite, while 1,200 m^3 will be removed offsite for appropriate reuse, recovery, recycling or disposal.

The Construction Environmental Management Plan (CEMP) outlines procedures for managing soil stockpiles, preventing dust generation, and controlling runoff, all of which are critical in the context of climate variability.

No significant adverse effects are anticipated during the operational phase, and the site will be suitable for long-term residential and commercial use.

Hydrology and Hydrogeology

Climate variability, such as increased rainfall or prolonged droughts, can affect water availability, quality, and management practices. This includes effects on stormwater runoff, flood risk, and water supply. The Hydrology Chapter outlines the Proposed Development’s water management strategies, including SuDS, attenuation systems, and flood resilience measures, ensuring robustness against future climate scenarios.

Air Quality

Air quality and climate are interrelated due to shared sources of emissions, particularly from the combustion of fossil fuels during both the demolition/construction and operational phases. These activities generate pollutants that contribute to both local air quality impacts and global climate change. The air quality assessment was undertaken in parallel with the climate assessment to ensure consistency in evaluating emissions and their potential impacts.

Material Assets: Waste and Utilities

The Proposed Development has been designed in accordance with relevant building design standards, including those related to energy performance and climate resilience. Low-carbon power and heating systems, such as centralised heat pumps and mechanical ventilation with heat recovery, have been incorporated to reduce reliance on imported fossil fuels and minimise GHG emissions. These design choices represent a direct and indirect interaction with climate and are assessed in this chapter.

Archaeology and Cultural Heritage

Cultural heritage sites are at risk due to climate change, with increased weathering, flooding, and temperature fluctuations potentially accelerating their deterioration. Mitigation measures employed at the Proposed Development will ensure that no significant impacts occur.

Material Assets: Traffic

Traffic-related emissions are a key contributor to climate change. The UK Highways Agency's DMRB guidance document LA 114 (2019) outlines criteria for determining whether a detailed climate assessment is required. These include:

- A change of more than 10% in Annual Average Daily Traffic (AADT);
- A change of more than 10% in the number of heavy-duty vehicles; or
- A change in daily average speed of more than 20 km/hr

These criteria were applied to both the construction and operational phases of the Proposed Development. For the construction phase, a Traffic & Transport Assessment Report prepared by NRB Consulting Engineers (2025) confirms that projected traffic volumes fall below the thresholds set out in TII guidance, based on project-specific traffic modelling. Therefore, no significant climate effects are anticipated from construction traffic.

For the operational phase, traffic flow information was obtained from NRB Consulting Engineers (2025) for the purposes of this assessment. Two different year scenarios are presented in Table 10-13 of Chapter 10: Air Quality of the EIAR: the 'Do Nothing' and 'Do Something' scenarios for the Opening Year (2028) and Design Year (2043), in line with TII guidance (Opening Year + 15 years). This data, based on project-specific traffic modelling, confirms that none of the impacted road links meet the DMRB thresholds.

As such, a quantitative assessment of traffic emissions on climate has been scoped out, and no significant climate effects are anticipated from either construction or operational traffic.

In summary, the Proposed Development's interactions with climate encompass a range of factors including GHG emissions, water resources, biodiversity, soil, human health, and cultural heritage. Effective mitigation strategies and robust monitoring will be essential to address these interactions, minimise adverse effects, and ensure the development's resilience to climate change.

11.17 Difficulties Encountered

Overall, there were no major difficulties encountered when compiling this assessment. Minor difficulties were encountered during the quantification of materials at the design stage in order to assess the embodied construction carbon. The exact volumes of materials, location of waste disposal sites, sourcing of products and technical specification for materials are finalised during the detailed design phase and by the appointed contractor. Throughout the assessment, efforts have been made to provide the most likely scenario of the embodied carbon assessment. Where it is required to make assumptions as the basis of the assessment presented here, these assumptions are based on advice from competent project designers and are clearly outlined within the chapter.

This is a standard and expected approach at this early stage, and assessment is appropriate on this basis. It is also important to frame these assessments in light of recent findings from the Housing Agency's report, 'Embodied Carbon and The Climate Impact of our Housing,' (2025) which highlights the significant role of embodied carbon in the built environment and underscores the need for comprehensive climate considerations throughout the entire lifecycle of housing developments.

11.18 Conclusion

The assessment of potential adverse effects resulting from the Proposed Development on climate change in this chapter has identified the potential sources of greenhouse gas emissions and vulnerability of the site to climate change.

It is reasonably considered that following all mitigation measures including design embedded and prescribed, adequate implementation of construction phase mitigation, and adherence to operational best practice that no significant effects to climate change will arise from the Proposed Development during the construction or operational phases.

Additionally, the operational and maintenance plan for the Proposed Development and the prescribed energy strategy will provide enhancement to energy efficiency over the long term.

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